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MACKENZIE VALLEY PIPELINE INQUIRY ^{Government} Publication

IN THE MATTER OF APPLICATIONS BY EACH OF
(a) CANADIAN ARCTIC GAS PIPELINE LIMITED FOR A
RIGHT-OF-WAY THAT MIGHT BE GRANTED ACROSS
CROWN LANDS WITHIN THE YUKON TERRITORY AND
THE NORTHWEST TERRITORIES, and
(b) FOOTHILLS PIPE LINES LTD. FOR A RIGHT-OF-WAY
THAT MIGHT BE GRANTED ACROSS CROWN LANDS
WITHIN THE NORTHWEST TERRITORIES
FOR THE PURPOSE OF A PROPOSED MACKENZIE VALLEY PIPELINE

and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND
ECONOMIC IMPACT REGIONALLY OF THE CONSTRUCTION,
OPERATION AND SUBSEQUENT ABANDONMENT OF THE ABOVE
PROPOSED PIPELINE

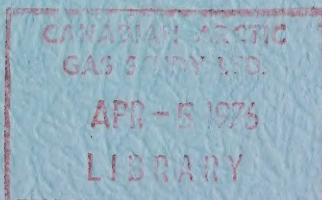
(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

March 24, 1976.

PROCEEDINGS AT INQUIRY

Volume 134



APPEARANCES:

Mr. Ian G. Scott, Q.C.,
Mr. Stephen T. Goudge,
Mr. Alick Ryder and
Mr. Ian Roland for Mackenzie Valley Pipeline
Inquiry;

Mr. Pierre Genest, Q.C.,
Mr. Jack Marshall, and
Mr. Darryl Carter for Canadian Arctic Gas
Pipeline Limited;
Mr. Reginald Gibbs, Q.C.,
Mr. Alan Hollingworth &
Mr. John W. Lutes, for Foothills Pipe Lines Ltd.;

Mr. Russell Anthony &
Pro. Alastair Lucas for Canadian Arctic Resources
Mr. Garth Evans Committee;

Mr. Glen W. Bell and
Mr. Gerry Sutton, for Northwest Territories
Indian Brotherhood, and
Metis Association of the
Northwest Territories;

Mr. John Bayly
or
Miss Leslie Lane for Inuit Tapirisat of Canada,
and The Committee for
Original Peoples Entitle-
ment;

Mr. Ron Veale and
Mr. Allen Lueck for The Council for the Yukon
Indians;

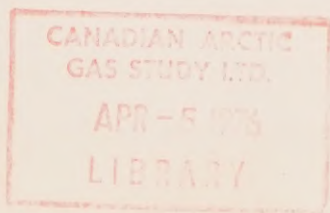
Mr. Carson H. Templeton, for Environment Protection
Board;

Mr. David Reesor for Northwest Territories
Association of Municipal-
ities;

Mr. Murray Sigler for Northwest Territories
Chamber of Commerce.

Mr. John Ballem, Q.C., for Producer Companys;

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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly
Yellowknife, N.W.T.

March 24, 1976.

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. BAYLY: Mr. Commissioner,
when we left this panel yesterday they were going to
consider some things over night and I'm wondering if
we could begin with that..

ROBERT WEBB,
DONALD DABBS
W.W.H. GUNN
PETER J. MCCART
RONALD JAKIMCHUK
DOUG ROWE, resumed:

CROSS-EXAMINATION BY MR. BAYLY (CONTINUED):

Q Gentlemen, I had asked
you to look over the remarks made by Mr. Williams of
Northern Engineering Services in his evidence concerning
the erosion of the west side of Shallow Bay and the
possible means that would be used to stabilize or to
stop the erosion, and to have your comments on that.
Have you had a chance to look at the remarks of Mr.
Williams?

MR. MARSHALL: Could you direct
that question to an individual, Mr. Bayly, please, and
I'm sure they will be happy to answer. You can pick
your first victim.

MR. BAYLY: I see, Mr. Marshall.
Your panel has cold feet, has it? Nobody wants to
begin. Let's start with Mr. Webb.

WITNESS WEBB: Yes, Mr. Bayly,
I've had a chance to look at the material and discuss
it further with Gas Arctic and Northern Engineering

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
CrossExam by Bayly

1 Services personnel, and the understanding I have is that
2 whatever choice of action is taken to remedy the
3 problem, that it would constitute activity during the
4 one-year plan for construction, and that maintenance
5 during the operating life of the crossing would not
6 necessarily be more than had initially been explained
7 to me. On that basis I feel that my opinion as to
8 the effect of the crossing on white whales would not
9 substantially change as a result of the stabilization
10 procedures, or the longer trenching procedures that
11 were discussed by Mr. Williams and Hollingshead -- Mr.
12 Hollingshead. The amount of suspended sediments in
13 the currents through Shallow Bay is not a factor, as
14 far as whales are concerned. It doesn't appear to be.
15 The area is heavily silted now and they can navigate
16 very well in heavily silted waters. A lot of natural
17 bank erosion is occurring and they've accommodated to
18 this over the years.

19 Q With regard to one of the
20 alternatives, which would be to come back and stabilize
21 the bank ten years from now approximately, would you
22 have any preference for that --

23 A I would suggest that the
24 best choice in terms of impact on whales would be the
25 one that would provide for heavy equipment on the
26 edge of the crossing, the fewest times over the operating
27 period, yes, to minimize the amount of noise and of
28 human presence over the life of the pipeline.

29 Q You would favor getting
30 it over in as few seasons as possible.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 A Preferably the one
2 construction year.

3 Q Mr. Dabbs?

4 WITNESS DABBS: From my point
5 of view I really don't have a particular preference from
6 strictly a vegetation point of view. However, if asked
7 which I would recommend, I would personally suggest
8 that the deep ditching back for 1,000 feet or more
9 leaving the channel banks to erode naturally as they
10 are today would be my preferred choice.

11 Q All right. Dr. Gunn?

12 WITNESS GUNN: From the point
13 of view of birds, a good deal would depend upon what
14 time of year the work was being done. I don't think this
15 is quite clear in the evidence. However, I would assume
16 that if the selection were to do channel training, that
17 this would of course be done in the summertime, and it
18 would require work over a mile or so of the west
19 bank so that we wouldn't be particularly in favor of
20 that type of activity at that type of time. So there-
21 fore I would tend to favor the deep channel method,
22 particularly if it could be done in the wintertime.

23 The alternative of having
24 a shorter deep channel and also some riprap work would
25 not be quite as favorable because of the riprap work.

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Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe,
Cross-Exam by Bayly

Q Dr. McCart?

WITNESS MCCART: My understanding is that the bank in that area is eroding naturally at a rate of about thirty feet a year and I think that regardless of what method is used that the additional sedimentation will really be insignificant in relationship to what is occurring already. But, generally, I would be in favor of whatever method would reduce the amount of erosion and again, take place over the shortest period of time. I don't think I would like, in general, to see a situation where you knew that you would have to go back in again at some time in the future. So probably the deep ditching method.

Q Would you prefer one time of the year over another from the point of view of any of the fish using that part --

A As far as Shallow Bay goes, we have not been able to demonstrate that Shallow Bay is an important migratory route. Most of the fish that are entering channels, apparently enter further on out in the delta. My feeling however, would be that there probably is some small amount of usage, and probably prefer winter construction in that area.

Q Now Mr. Jakimchuk, this may be of less concern to you than the others, but you may have some comment you wish to make on it.

WITNESS JAKIMCHUK: Yes, the area in question is not one of a critical mammal concern. But, my own preference in terms of general environmental

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe,
Cross-Exam by Bayly

1 considerations is to employ a method that will not
2 require constant maintenance and repair and it seems to
3 me that the deep ditching -- a thousand feet of deep
4 ditching accomplishes that, so that's what I would favor

5
6 Q Now, I believe the one
7 other matter that was left was yours, Mr. Webb. You
8 were going to consider the possibility of an oil line
9 using the same corridor as the natural gas pipeline and
10 tell us whether you felt you could make a comment on
11 that today.

12 WITNESS WEBB: I don't feel
13 I can make a very enlightened one, Mr. Bayly, but I'll
14 give it an attempt. The construction of an oil line
15 as far as I can see, would not materially differ in
16 impact on whales from that of a gas line. However,
17 it would add potential interference for those whales
18 that do go into Shallow Bay during the short period
19 they do go into Shallow Bay, but of the same nature of
20 effect. However, to the degree that a spill or a break
21 is possible, and I have no way of assessing the
22 probability or the odds of that occurrence or the amounts
23 of oil that may be released into Shallow Bay.

24 But, assuming that this were
25 to happen, then of course there is a possibility of
26 avoidance actions taken by the whales, if that spill
27 occurred during that time that the whales were in Shallow
28 Bay, at the mouth of Shallow Bay or in the West Mackenzie
29 Bay.

30 So, you would have to have

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe,
Cross-Exam by Bayly

1 quantities of oil during the month of July on the
2 surface of Shallow Bay for there to be any material
3 and I repeat I have no concept of how likely that ^{would be,}
4 impact. Now, if that were to occur, then that certainly
5 could have an affect on calf survival during that year.
6 Whales also, I might mention, do have other options of
7 staying in warm water, so it's also possible that they
8 could move to other areas and therefore, satisfactorily
9 avoid any oil spill.

10 The matter is a rather complex
11 one of course, and I'm generalizing and I feel that
12 that's about as far as I can go at this time.

13 Q Do you have any opinion
14 as to whether it might cause them to abandoned the
15 traditional area on a permanent basis?

16 A I would doubt that very
17 much. I would think there would be an immediate avoid-
18 ance reaction, and they might come back during the
19 same calving period. But definitely, they would 'be
20 back the next year. I just don't imagine -- I just
21 can't imagine that there would be a long-term effect
22 of a single episode such as I'm speculating on.

23 Q Your feeling is based on
24 I assume, the ability to clean up an oil spill if one
25 were to occur during the the year in which it did .
26 happen?

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 A Or the disappearance of
2 the oil, yes, sure, through volatization or dispersal,
3 yes. I'm sure that the open waters which the whales
4 frequent would be free of oil, fairly quickly. There
5 would be accumulations along the beaches which shouldn't
6 bother the whales.

7 WITNESS GUNN: Mr. Bayly, I
8 would like to add a point.

9 Q Yes, Dr. Gunn.

10 A In clarification of a
11 response that I made to the Commissioner yesterday,
12 on this subject, in regard to an oil pipeline across
13 the delta. My concern is not with the pipeline itself.
14 Above ground, and probably on supports, I don't
15 consider that this is a problem as far as birds are
16 concerned. My concern is with the possibility of oil
17 leaks or spills along the line, in areas that are
18 of particular importance to birds, since there are
19 numbers of these in the delta. I feel it might be
20 difficult to find a suitable route across the delta
21 on that basis.

22 Q Were there any other
23 panelists that had any further thoughts on the
24 possibility of an oil line crossing in the same
25 vicinity as the gas pipeline, across the delta, before
26 we leave this? In that case, perhaps we can go on
27 to you, Dr. -- Mr. Jakimchuk, with regard to your
28 recommendations on -- for safeguarding grizzly bears
29 that may be in conflict with construction and other
30 personnel. Your second recommendation is to avoid

Webb, DAbbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 vehicular harassment, and I take that to mean aircraft
2 and ground vehicles, is that correct?

3 WITNESS JAKIMCHUK: That's
4 correct.

5 Q And have you made
6 recommendations to the applicant, with regard to
7 whether these recommendations should be incorporated
8 into company rules, or whether they should be part
9 of a game management plan carried on by government?

10 A I think personally, they
11 should be both. We have not specifically singled
12 out and said we think they should be part of company
13 rules because when we make a recommendation like that,
14 that's sort of the underlying premise, that that's
15 the reason we make it.

16 Q And you've, I gather,
17 read the evidence of Dr. Lent, with regard to the
18 experience with bears and construction personnel in
19 Alaska, on the Alyeska line, is that correct?

20 A Yes, I did read that. I
21 don't know if I recall it that well, but --

22 Q As I understand it his
23 indications were that despite some quite strict rules
24 of the Alyeska company, it was impossible to keep
25 people from feeding bears, and driving up to them in
26 vehicles, and this sort of thing. Do you feel that
27 we may be faced with an impossible situation, to
28 completely enforce --

29 A Well, there are some
30 differences. Number one, the Alyeska line had a

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 permanent road associated with it, providing access,
2 vehicular access, during the summer period when bear,
3 wolves were active; went through mountainous areas.
4 Referring to the cross-delta route, during the winter
5 construction period in any event, bears would be in
6 dens, and we have recommended specifically that denning
7 areas be avoided. So there is an unlikely chance that
8 bears would be out and about, and available for being
9 fed. I also realize --

10 Q Just before you go any
11 further, Mr. Jakimchuk, that isn't really the case with
12 regard to the construction of compressor stations or
13 the crossing of Shallow Bay, or --

14 A That's correct, but I do
15 feel I should distinguish between activity over a right-
16 of-way, such as that, on a road, on permanent road
17 during the summer, and activity at specific sites,
18 such as compressor stations and river crossings. I
19 think that no matter how strict rules are, or how
20 well-intentioned, they certainly have to be enforced,
21 and I think that it's important that they be enforced.
22 I don't condone, for example, what's happened on
23 Alyeska. We saw some slides of parties of men feeding
24 animals, and I don't know whether they were staged or
25 not. Sometimes these types of things are staged, you
26 know.

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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

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Q You mean a man in a
bear costume or --

A Well, you know they are done
specifically for the purpose of a dramatic impact but
I don't condone that. I think that rules should be
enforced, period, and I think that this is part of
the job of the environmental inspection, both of
government and of the applicant.

Q You'd want to see some
teeth in the regulations, no matter whose they were,
then, I take it.

A Yes. You know, if a
person is caught breaking the rules, perhaps he should
be fired, for example.

Q All right, and with
regard to the regulations that you might envisage on
the matter of garbage incineration, do you feel that
they should have similar kinds of teeth in them?

A Well, let me just say
generally that regulations such as I have -- recommenda-
tions such as I have set out here, I think they should
all have teeth in them and I think they should all be
implemented and I don't think there is any excuse not
to do so. I think that the applicant fully agrees
with that, that matters of garbage disposal and inciner-
ation are areas that they have to pay close attention
to and do well. I think as far as I am aware in any
event the track record on camps that I have seen has
indicated that they have that capability. For example,

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 the Sans Sault test facility was always one where
2 scrupulous attention was given to garbage disposal
3 and sewage and such like.

4 Q Now with regard to avoid-
5 ing man-bear conflicts, we had in Inuvik the evidence
6 of Dr. Stirling, and I wonder if you've had a chance
7 to look over that and whether you care to comment on
8 some of the methods that he suggested for avoiding
9 man-bear conflicts?

10 A I don't have that before
11 me. I have read it. As I recall, he suggested the
12 use of dogs, electric fencing, and possibly acetylene
13 exploders. I think those were the three things that
14 he --

15 Q That's right, they're
16 found in the transcript at 18549, and perhaps I could
17 just read you the passage. It begins at line 3:

18 "The problem of man-bear conflicts and how to
19 minimize them would be included here. No single
20 method or activity is known to be completely
21 successful in deterring bears. However, some
22 things are helpful such as keeping camps
23 clean of attractant odors such as garbage,
24 having dogs outside for warning, and the use
25 of explosive-scaring devices . Electric fences
26 have been used fairly successfully on grizzly
27 bears to keep them out of garbage dumps at
28 Yellowstone Park."

29 I gather some of these things overlap with your
30 recommendations, possibly with the exception of keeping

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 dogs which you and Dr. Stirling, I think, have some
2 disagreement on.

3 A No, we don't have any
4 disagreement on that. I can recall you asking me that
5 question on a previous panel and I just said that I
6 wasn't aware of that as being a useful device, and
7 thought that -- I have no disagreement with it at all.
8 It's just that I have no knowledge of its efficacy.

9 Q Now, you talk in your
10 evidence about the treatment of problem bears, and in
11 some instances recently in camps that have surrounded
12 drilling rigs and various other operations in the
13 delta and beyond, the problem bears have been dealt
14 with by shooting them. Now, I gather under some
15 circumstances there are very few choices, but would
16 you be prepared to recommend that personnel be equipped
17 with tranquilizing equipment as opposed to just having
18 rifles available to kill the bears?

19 A That is a very tricky
20 proposition, I think, that you have advanced. Let me
21 just say that if there is a question of imminent danger
22 to human life there is no question human life has to
23 be protected; if that entails the shooting of a bear,
24 well that is what normally is done and I can't dis-
25 approve of that. I would feel that, however, all people
26 in camps should be given specific training as to
27 procedures in the event of an interaction with a bear,
28 so that there is not indiscriminate or wanton shooting
29 of bears. A bear walking by at 100 yards should be
30 left alone, for example, and not become or not be

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 pursued and not be shot at a distance. I think a lot
2 of shooting that takes place is not necessary because
3 people are not aware of the alternatives to shooting
4 the bear. They have a reaction of fright.

5 I do not favor tranquilization
6 of animals by inexperienced personnel, so that I would
7 say if human life is not imminently in danger the
8 procedure should be to inform the game authorities to
9 deal with the question. The reason I don't favor
10 tranquilization is that it requires the estimation of
11 weight and dosage of the appropriate drug. There are
12 dangers inherent in over-dosing or under-dosing; a person
13 can walk up to a bear that can wake up and this type of
14 thing. So I think that tranquilization should only be
15 done by qualified personnel, perhaps one man trained
16 for that might be a suitable approach, but it's not a
17 simplistic solution.

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 Q So, in certain camps,
2 that might be more likely to have bear - man conflicts,
3 you could see the possibility of having a trained per-
4 son available to deal with bears with whatever means
5 seemed the most appropriate.

6 A Yes, I think we would like
7 to see an actual briefing program take place for
8 personnel that might find themselves in such a situation
9 and have a set laid down procedure. In the long term,
10 if you're speaking of, a say, compressor station site,
11 of course, I am assuming that these will be fenced, so
12 that there will not be a direct interaction between
13 bears and men sort of on a surprise basis.

14 Q All right and we've heard
15 from Dr. Novakowski with special regard to the bears,
16 that camps may be in conflict with on the east side of
17 Shallow Bay and that population, as I understand, is
18 really quite small. Are you prepared to agree that it
19 isn't a very big population of grizzly bears?

20 A What are you referring to
21 now, the Richards Island population?

22 Q Yes.

23 A From the reports we have
24 from Slaney's work on Richards Island, I think the
25 population is some 32 bears on Richards Island, which
26 actually surprised me when I first read it because I
27 wouldn't have thought there would be that many bears
28 there. So, whether it's small or large, I guess is a
29 matter of interpretation. You know, at first glance,
30 the delta area doesn't seem to be a prime habitat

Webbs, Dabbs, Gunn, McCart,
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1 for the species.

2 Q Well, it may be a large
3 population for the habitat but would you agree with me
4 that it wouldn't take very many bear - man conflicts
5 that resulted in dead bears to affect the population
6 pretty drastically?

7 A It wouldn't take many
8 dead bears to affect the population, I don't think.
9 Particularly if they were female. But whether it
10 would take many man - bear conflicts is another question.

11 Q Yes, I understand that --

12 A Yes.

13 Q -- if you can deal with
14 them without shooting them, then you haven't --
15 Mr. Jakimchuk, have you addressed yourself or has your
16 staff thought of any problems that may occur if snow
17 is harvested off lakes in the vicinity of the cross-
18 delta route for the building of snow roads and what that
19 may do to any muskrats inhabiting the lakes?

20 A We have not specifically
21 addressed that question, with respect to muskrat.

22 Q Do you anticipate surveying
23 lakes to be able to tell Mr. Williams the ones which
24 he might be better to avoid?

25 A We've already carried
26 out some surveys assessing the areas in terms of
27 suitability for muskrat. I must say quite frankly that
28 I'm not very concerned of the activities having a
29 permanent or an adverse affect on muskrat populations.
30 I think the species itself has characteristics that

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 indicate it is extremely resilient to even extreme
2 disturbance and human activity. For example, if I
3 were to say to you Mr. Bayly that crossing a lake would
4 wipe out fifty percent of the muskrat populations, you
5 would probably be startled. However, that situation,
6 a reduction of population by fifty percent occurs in
7 any given year through natural mortality.

8 I'm not really too concerned
9 about muskrats being affected by human activity for
10 the following reasons. They have a very high reproduc-
11 tive rate, high rates of natural mortality. They tend
12 to be a short lived species which -- species such as
13 that have high turn-overs in populations. What this
14 means is they have a great capacity to increase their
15 numbers and expand their range when conditions are
16 favorable and can tolerate a very great amount of
17 actual killing and stress and disturbance.

18 So, to tell you the truth,
19 I just am not concerned about muskrats being extirpated.

20 THE COMMISSIONER: Their
21 habitat in the delta lies more or less in the upper
22 delta to the south of the crossing in any event?

23 A That's correct, Commissioner.
24 Some work that Vern Hawley did a number of years ago,
25 where he surveyed pushup as indices of density of
26 populations established, I think it was some 78 percent
27 or in excess of 75 percent of the populations occurred
28 in the southern half of the delta, which is a far more
29 important part. The other consideration as well, Mr.
30 Bayly is the fact that each individual lake is a unit

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 in itself so that an affect on one given unit doesn't
2 affect the whole system. Assuming there was a drastic
3 decline in muskrats, repopulation could take place
4 from other units of habitat around. So, I consider the
5 species to be very, very resilient.
6

7 You may be aware, for example
8 that in Louisiana, which is a highly developed state
9 with a high population, I believe the numbers of
10 muskrats trapped and sold in any given year in Louisiana
11 rivals the production of Canada.
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 Q You mean in the Mississippi
2 Delta?

3 A Yes, well not just the
4 Mississippi, but the various swamp lands, the flooded
5 forests and so on.

6 MR. BAYLY: There are climate
7 differences.

8 A Oh, certainly, but the
9 point is, the species ranges throughout North America,
10 in some cases, in very close association with human
11 activity, and has also been shown to be amenable to
12 manipulation of its habitat. Of course one of the
13 techniques in terms of marsh management for waterfowl
14 and muskrat, is to manipulate water levels, and there
15 are species whose productivity can be increased by
16 such types of manipulation. The main requirement is,
17 if the water depth is adequate for over-wintering, they
18 will prosper, so the only thing I would be concerned
19 with, with respect to muskrat, would be the significant
20 lowering of water depths in lakes where they have high
21 populations and over-winter.

22 Q So the possibility that
23 you see is that there may be some lakes from which
24 snow is harvested, for example, for snow roads, where
25 muskrats may suffer higher mortality than usual, because
26 of increased ice thicknesses, or the scraping over of
27 pushups, but that they will come back.

28 MR. MARSHALL: Mr. Bayly didn't
29 ask him that. He wasn't asked that at all sir, he
30 wasn't asked for an opinion as to whether or not

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 harvesting would have any affect on muskrats?

2 THE COMMISSIONER: I know he
3 wasn't. That's an assertion by Mr. Bayly, that I think
4 he's asking Mr. Jakimchuk to comment on. Mr. Bayly
5 is searching for an adverse impact that may occur, and
6 he's isolated this one he's just discussed. Does that
7 sound reasonable, acknowledging that these are separate
8 systems, and there might be a thousand lakes, and only
9 a miniscule number affected by the snow harvesting
10 activities of Mr. Williams and his construction crews.
11 Does that all hang together or do you think that Mr.
12 Bayly hasn't got anything to go on?

13 A Well, I'm just
14 not really sure what the question is?

15 MR. BAYLY: Let me repeat it.
16 I believe I started off talking about the construction
17 of snow roads, and you may have thought I was talking
18 about roads over ice. What I had originally begun with
19 was wondering whether, if you harvest snow off lakes,
20 it will in those lakes adversely affect the muskrat,
21 in that lake?

22 A There's a possibility of
23 temporary adverse affect, of , in my opinion, small
24 proportions.

25 Q I'll leave it at that.

26 WITNESS MCCART: Could I make
27 a comment? The delta is obviously one area where there's
28 a vast quantity of water during the winter, and it may
29 not be -- probably wouldn't be necessary to harvest
30 snow from lakes in any case. I think that there's a

1 technique, and the engineering people unfortunately
2 aren't here, but I think it's a technique that would
3 be looked on with more favour in an area where water
4 was not easily available.

5 THE COMMISSIONER: I think that's
6 what Mr. Williams said, parts of the North Slope and so
7 forth.

8 MR. BAYLY: Now, could we turn
9 to you then Dr. McCart? On page 3 of your prepared
10 evidence, you say that you proposed monitoring of
11 fish migrations in the vicinity of the crossing, both
12 upstream and downstream. How would you suggest that
13 this is to be done, in the turbid waters you'll find
14 in --

15 A Well, obviously it can't
16 be done by simply looking, as it can be in places like
17 Firth River. It would be a matter of having to set
18 up a lead, and trapping fish at a point both upstream
19 and downstream of the disturbance, or possibly gill-
20 netting, if that were the only method that were
21 possible; but I can conceive of setting up a long lead
22 out into the current, leading fish into a pound trap,
23 or into a fight net, and you could if you wanted to,
24 tag the fish at the lower one, and find out whether
25 he in fact showed up at your upper trap upstream of
26 the disturbance. This kind of approach.

27 Q And you'd have^{to} begin that,
28 I take it, in a season prior to construction, to give
29 you a baseline?

30 A No, I don't think you
need a baseline, you simply have to monitor the run

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 as it's occurring, during a season in which you're --
2 again, we're primarily interested in knowing whether
3 fish that show up downstream are able to pass through
4 the area and can be taken upstream of the disturbance.

5 Q And how much of a success
6 rate would you have to show to know whether or not fish
7 were actually passing or not? In other words --

8 A You'd also, I might add,
9 be looking for accumulations. You'd want to know
10 whether fish were being held up. If you can -- you
11 could set up a grid of gillnets, or something or this
12 sort. Now I'm not talking about fishing these
13 continuously, but to determine whether there's an
14 accumulation of fish downstream of the operation.

15 Q Then there are two things
16 you want to test. One is whether they are being delayed
17 and the other is whether they are crossing at all?

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 A Yes, if they're being
2 delayed they're not crossing, so really they are
3 essentially the same thing.

4 Q And I suppose there's
5 a possibility that they just wouldn't cross at all
6 and try and seek some other way.

7 A That's possible. I should
8 point out that it seems to me that the likelihood is
9 that with the kind of operation planned, the likelihood
10 is quite small that a significant proportion of the
11 migrating population is going to be delayed by the
12 kind of operation that is planned for the cross-delta
13 route at least.

14 Q What would you say the
15 effects of delaying would be of the fish that were
16 moving towards spawning areas?

17 A It can be significant
18 in some instances, with spring spawners especially
19 because these things ripen up over the course of the
20 winter and grayling, for instance, spawn within a
21 very short period as the spring flood is declining.
22 Now we aren't going to have that problem with the
23 cross-delta route. Now these fall spawning fish under-
24 take a fairly extensive migration and in most instances,
25 for instance with Arctic cisco and things of this
26 sort, the time period between the time that they pass
27 by at some point on the cross-delta route and the
28 time that they would actually spawn is probably a
29 matter of at least weeks, and in some cases more than
30 a month, so that if there is a short-term delay of

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 a few days it's not going to have any significant
2 effect on them, I don't think.

3 Q But they do have a long
4 way to go, as far as we can tell from the information
5 available is that correct?

6 A Yes. Some of the
7 populations at least have a long way to go. Some
8 apparently not so far.

9 Q So it might be more
10 important to those that have a long way to go to be
11 able to keep going and not experience a delay?

12 A No, my feeling would
13 be that those who have a long way to go have got more
14 -- a greater slop, they've got more time to make up.
15 Again I really don't think it's going to be a problem
16 because this area is turbid, in any case, and I don't
17 think there's any evidence that fish are disturbed by
18 noises or are at least held up in their migration.
19 There are some species possibly that tend to stay
20 away from areas of high turbidity, and yet there are
21 other species which in fact seek out areas of high
22 turbidity during migration. The fish that are using
23 the Mackenzie obviously are adapted to a high level
24 of turbidity because the river itself is that kind of
25 river. Again, as I say, we want to monitor it and
26 if there is some indication of a delay then we would
27 have to recommend that the operation be shut down for
28 a short period of time.

29 Q Would you be recommending
30 that the operation be stopped during the time when the

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 greatest concentration is migrating up through Shallow
2 Bay?

3 A There is no great concen-
4 tration migrating through Shallow Bay. We haven't been
5 able to detect any. As I say, most of the migration
6 appears to take place in the channel. The fish are
7 probably reacting positively to current. There's very
8 little current in Shallow Bay. So that the West Channel
9 would be a more important migratory route, Moose
10 Channel in the western part of the delta probably than
11 Shallow Bay itself.

12 Q So your feeling is that
13 the other channels are more important than Shallow
14 Bay, eh?

15 A As migratory routes, yes.

16 Q Do you know enough about
17 them to be able to say which are more important in
18 terms of either numbers or populations that use them?

19 A Well, I think we can say
20 that probably the most important one is the East
21 Channel and that West Channel is possibly only modera-
22 tely important. Moose Channel seems to be utilized
23 by some populations which are moving upstream to
24 Big Fish River and Rat River, and places like this.

25 I want to point out also
26 that in crossing channels like East Channel and Shallow
27 Bay, the fish isn't going to be presented with a wall
28 of turbidity because at any one point, that dredging
29 is taking place at only a single point across the
30 channel, so that the fish has the opportunity to move

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 laterally across the stream further out into the
2 stream closer to one shore as opposed to the other,
3 and thus essentially avoid any additonal turbidity
4 whatsoever.

5 Q O.K. Can I turn to you,
6 Mr. Webb, please? Start with a definition from the
7 first page of your evidence, please. You speak of
8 whaling opportunity, and I wonder if you could tell us
9 what you mean by that?

10 WITNESS WEBB: Yes, the
11 opportunity for people essentially at Bird Camp and
12 west Whitefish Station on Shoalwater Bay to capture
13 whales.

14 Q And again on the last
15 paragraph of that page the sentence reads that:

16 "Boat and air traffic will be kept to a minimum
17 through West Mackenzie Bay."

18 Did you get any indications of what "to a minimum" meant
19 in terms of numbers of boats and airplanes and the
20 frequency?

21 A No, that's my recommenda-
22 tion and it's a general one. I feel that occasional
23 traffic probably wouldn't materially affect the whale
24 hunting opportunity, but a regular procession of boat
25 traffic may, and I think that should be avoided, if
26 possible.

27 Q You're aware that Dr.
28 Gunn with regard the aircraft overflights worked out
29 a recommended frequency. Would you be preparing that
30 sort of information for the applicant so that they could

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C ross-Exam by Bayly

1 know about timing of their various operations, or
2 whether they should run a number of boats at one time
3 together?

4 A No, I hadn't given any
5 consideration to that. The point of concern I had
6 was with respect to the possibility of tug and barge
7 traffic hauling gravel from a storage area or a quarry,
8 I'm not sure which, somewhere around Shingle Point to
9 the Shallow Bay crossing, which had been brought to my
10 attention by Arctic Gas engineers as a possibility.
11 This kind of traffic was -- is to be avoided, I think,
12 in my estimation, at the time that people are attempting
13 to whale in that general vicinity.

14 Q Would you feel that it
15 might be useful to be able to indicate to Arctic Gas
16 whether it would be more sensible to run a number of
17 boats and barges together, or whether that has less
18 or more effect than a string of barges run continu-
19 ously over a period of hours or days?

20 A Well, in this instance
21 I was given to understand that in view of my concern
22 and the possibility of interference with the whale
23 hunt, that that period of July would be avoided for
24 that kind of gravel haul. So therefore there doesn't
25 appear to be a requirement for those detailed recommen-
26 dations that you're implying.

27 Q Well, you've been satis-
28 fied that they'll keep it to a minimum and I'm just
29 wondering if we can find out, Mr. Commissioner, from the
30 applicant whether "kept to a minimum" can be quantified,

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CrossExam by Bayly

1 they do have logistics people that may be able to
2 tell us how much a minimum would be during that season.
3 I wonder if Mr. Marshall could attempt to find that out?

4 MR. MARSHALL: I wonder if you
5 could define it a little more closely? Are you talking
6 about Shallow Bay per se? Are you talking about
7 west Mackenzie Bay , or are you talking about both?

8 M R BAYLY: I'm talking about
9 west Mackenzie Bay, because that's what's referred to
10 in the evidence, Mr. Commissioner, and the sentence says
11 that:

12 "I must add that my opinion is based upon the
13 understanding received from discussions with
14 Arctic Gas personnel that boat and low level
15 air traffic in late June and during the month
16 of July will be kept to a minimum through west
17 Mackenzie Bay."

18 I assume from that, sir, that they have some idea of
19 what that minimum would be and I'd like the benefit of
20 that information, if it's available.

21 MR. MARSHALL: I'll see if I
22 can find that for you.

23 MR. BAYLY: Q I take it on
24 page 3 of your evidence your recommendation No. 5 is
25 again one to which we can't pin a number at this time?
26 That is that aircraft and boat landings at whaling
27 camps be kept to a minimum.

28 A Yes, I may be guilty of
29 a bit of a generalization there. I think I should have
30 said "should be avoided". But there is no reason that

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Cross-Exam by Bayly

1 I can find in any of the engineering material that I
2 have perused to suggest that there would be boat
3 traffic or aircraft arriving at the camps. However,
4 there is the possibility and my concern was that if
5 it became that there might be some interference with
6 the whaling activity, if visitations were quite numerous
7 then I'm thinking in terms of almost of social visits
8 to see what's happening in camps by personnel during
9 their time off.

10 Q And I gather that that
11 is a problem already at some of the whaling camps and
12 it's not due to Arctic Gas, it's just that people
13 want to go and see what's going on, and this is a
14 situation that you could see becoming more important
15 in terms of the success of the whale hunt if a large
16 number of company personnel were added to the tourists,
17 if I can call them that, that already go to see
18 what's going on?

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1 A Yes, I think I^{would} stop short
 2 of saying it's a problem to this point but certainly
 3 visitations are made and it could become a problem
 4 if carried to the extreme, yes.

5 Q Mr. Webb, in the
 6 evidence of Dr. Sergeant, at page 18482 and 3 of the
 7 transcript, --

8 MR. MARSHALL: What volume was
 9 that, Mr. Bayly?

10 MR. BAYLY: I believe it's
 11 volume 122, , Mr. Marshall.

12 MR. MARSHALL: Will the witness
 13 need this?

14 MR. BAYLY: He will if I can't
 15 find it.

16 A What was the reference
 17 again Mr. Bayly?

18 Q 18482. Dr. Sergeant
 19 suggests in his evidence that the Churchill River
 20 experience that he had, indicated that calving whales
 21 are ^{more} sensitive to disturbance than other aggregations
 22 of whales. Would you agree with that?

23 A Yes, I'm not a position
 24 to disagree. I have no personal experience with the
 25 Churchill situation and I've read Dr. Sergeant's
 26 testimony and I have no disagreement with it.

27 Q The indications are that
 28 whales coming into both Shallow Bay and West Mackenzie
 29 Bay do so either to have their calves or at least to
 30 rear their calves.

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1 A You're asking for a comment
2 on that?

3 Q Yes, that's the indication
4 I understand.

5 A Well, that's the indica-
6 tion but unfortunately, there is no proof of that.
7 But certainly, that's the assumption, yes.

8 THE COMMISSIONER: Well, your
9 evidence seemed to me to be that on balance you felt
10 that they had their calves in West Mackenzie Bay and when
11 they came into Shallow Bay, it may have been seeking
12 warmer water for the comfort, at the very least, of the
13 calves. But, your evidence appeared to be -- maybe
14 I'm confusing you with Dr. Sergeant now, but your
15 evidence appeared to be that the vital area really was
16 West Mackenzie Bay and not so much Shallow Bay. In fact,
17 I think you made that pretty plain.

18 A Yes, right and I guess
19 I'm getting a little picky in saying we have no evidence
20 that the calving occurs in that area. The deduction is
21 made on the basis, primarily, of one year -- one year's
22 observation where no calves were seen in June among the
23 whales approaching the estuary but calves were seen
24 later among the whales in the estuary. But because of
25 the high silt, it's virtually impossible to be assured
26 just where they do calve. Certainly, I wouldn't argue
27 with that assumption.

28 Q Let me ask
29 you this. Both Dr. Sergeant and you indicated that there
30 was a great deal we didn't know about the behavior of

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

1 these whales but you both appear to feel that they
2 calve, in fact, before they reach Shallow Bay. I think
3 he's really relying very much on your own observations;
4 F.F. Slaney and Company's observations. But, --

5 MR. SCOTT: Mr. Commissioner,
6 can I just interject to clear that up. I wasn't here
7 when Dr. Sergeant gave evidence, but I've read his
8 evidence and I've read Mr. Webb's evidence and he can
9 correct, as I didn't understand either of them to say
10 that whales didn't calve in Shallow Bay. I understood
11 Mr. Webb to say that there were probably less in Shallow
12 Bay than in other parts of the Mackenzie, but I may have
13 that wrong. But your question and his answer seems to
14 suggest that whales do not calve in Shallow Bay and I
15 didn't understand that to be anybody's view.

16 THE COMMISSIONER: Well, let
17 me say that I understood the thrust of Mr. Webb's
18 evidence to be that so far as he can tell, and he's
19 not at all certain about any of this, but so far as
20 he can tell, it appears that they calve in West Mackenzie
21 Bay and in other parts of Mackenzie Bay, even in Kugmallit
22 Bay, that when they go into Shallow Bay, it appears to
23 be searching for even warmer water to enable the
24 calves in the first few days or weeks of life to survive.

25 But it doesn't appear that
26 they enter Shallow Bay to calve. That's what I thought
27 all of this was about.

28 A I think that's essentially
29 correct, Mr. Commissioner, in that in at least one of the
30 four years that we've observed whales, we saw no whales

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1 in Shallow Bay per se but there were large numbers in
2 West Mackenzie Bay right to the mouth of Shallow Bay
3 and they calved successfully that year in that there
4 were a number of calves seen later as they were depart-
5 ing the area. So, at least in that year, they certainly
6 did not calve in Shallow Bay per se. I think it's
7 fair to say that they presumably calve somewhere in
8 ten degree waters, celsius or better, within the
9 estuary and that in fact, that the actual location in
10 which they find themselves when the calf drop occurs,
11 may vary a few miles.

12
13 The important thing is the
14 temperature of the water and to a perhaps a lesser
15 degree, the calmness of the water. Kugmallit Bay where
16 we're not sure of at all in that some years they arrive
17 in Kugmallit Bay very late. In fact, talking to
18 whalers from Tuktoyaktuk, I think they tend to feel
19 that in some years at least, the calves have been
20 dropped before the whales arrive in Kugmallit Bay. In
21 other years, I would suggest they may calve there.

22 THE COMMISSIONER: Yes. Well,
23 one thing emerges from this. At least it appears to.
24 Are you in a position to express an opinion as to
25 whether access to Shallow Bay is essential to the
26 survival of at least some part of the crop or the
27 calves in a given year? Have we run that to earth or
28 are we still --

29 A To my satisfaction we
30 have and that's one of the thrusts in my testimony.

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1 I accept that it may not be written as clearly as it
2 might. I feel the evidence suggests that on the basis
3 of one year at least, that the whales could successfully
4 calve in West Mackenzie Bay and need not be able to
5 penetrate deeply into Shallow Bay and that consequences
6 to the calve crop of that would not be serious and
7 I'm deducing that from the extent of the warm-water
8 plume in Mackenzie Bay. It's very, very broad. The
9 ten degree or better temperature extends many, many
10 miles out from the mouth of Shallow Bay.
11

12 Plus the fact, that in at
13 least one year, apparently all the calving in that part
14 of the estuary took place in West Mackenzie Bay and
15 not Shallow Bay and perhaps in other years as well.

16 MR. SCOTT: Is Dr. Webb
17 referring to any other years that we can check out,
18 or is that just supposition?

19 A It's a supposition based
20 on the distribution of the whales and the time of
21 arrival into Shallow Bay. I might give you an example
22 -- the 1975 year. No whales were seen deeply into
23 Shallow Bay until about July the 28th, by which time
24 it's pretty well assumed that most of the calves would
25 have been dropped and I think Dr. Sergeant would agree
26 with this.

27 THE COMMISSIONER: Yes, the
28 only difficulty with your observations regarding the
29 entry of whales into Shallow Bay appear to be a
30 difficulty you raised yourself. That is, owing to the

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Bayly

1 turbidity of the water in the Mackenzie Delta, your
2 observers may simply not have seen the whales that
3 were there. I think you said that yourself when
4 you gave evidence at Inuvik. Did I get that right?

5 A Yes, that's correct.

6 The surveys were flown essentially as often as possible
7 but because of fog, weather conditions and other
8 demands on surveyors time, the surveys were not
9 made daily so there is a possibility that whales could
10 have come in and gone out of Shallow Bay and been
11 missed by the surveyors. But their duration of stay
12 would have been very short, but it's still a possibility.

13 THE COMMISSIONER: Yes.

14 MR. BAYLY: I gather though,
15 Mr. Webb, one of the things that we still don't know
16 is calf survival rates at the present?

17 A No, that's right. We
18 don't. We have population estimates over a number of
19 years. That is, total population estimates of mature
20 animals or near mature animals and mature animals.
21 Those estimates would indicate that -- and I think
22 Dr. Sergeant's testimony bears this out, that over the
23 last 15 years or so, the population has been stable
24 or in fact, increasing and has not declined. Our
25 evidence over the last four years certainly bears this
26 out.

27 Q We've been told with
28 regard to caribou that it may be more important to
29 know how many calves there are at heel after a period
30

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Cross-Exam by Bayly

1 of time after birth and I'm wondering if that's true
2 with whales too, that calves that survive for a certain
3 period of time, are more important to consider than
4 the number of live births?

5 A Yes, I think that's true.

6 I would perhaps change the expression and not say "at
7 heel".

8 Q Yes.

9 A I'm not sure what the
10 expression would be for whales. But, I think even
11 more important is the recruitment of yearlings to the
12 population one year hence. These are the animals that
13 have made it through the period of early high mortality
14 and are likely to reach sexual maturity and add to the
15 population, yes. Unfortunately, those figures are not
16 available either.

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1 Q And the thing that we
2 may not know enough about is the importance of Shallow
3 Bay and West Mackenzie Bay, to the survival of the
4 population. It may be possible, for example, for
5 whales, for a year, to move to West Mackenzie Bay, but
6 it may be that the population requires Shallow Bay
7 to ^{be} properly distributed to benefit from the warm waters
8 in the numbers that do come and congregate in that area.

9 A I don't think the evidence
10 suggests that it's that critical. I think though, that
11 because the whales seem to want to go there, that there
12 is some survival value, or else it's just a more
13 pleasant place, ^{I'm not sure which,} but we assume that there may be survival
14 value. However, I think that our data do suggest that
15 the larger area of West Mackenzie Bay, and up to and
16 including the mouth of Shallow Bay, is perhaps of
17 critical significance. There's no argument there. I
18 fully concur with the statements that Dr. Sergeant
19 has made in that respect. It's merely that penetration
20 of whales into Shallow Bay itself, seems to be on
21 an intermittent basis, and for relatively short periods,
22 survey problems notwithstanding, and therefore is
23 perhaps less -- has proven to be of less critical
24 nature than the major concentration area in West
25 Mackenzie Bay.

26 I think if you look at our
27 four reports, you'll find that in all four years, one
28 area on the west side of the estuary, has been used
29 each year. Now, that area is not Shallow Bay, it's
30 in Mackenzie Bay, and in fact, it's where most of the

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Bayly

1 local people hunt. It's fairly close to the hunting
2 camps, and if any area is critical in terms of calving
3 and or calf survival during the first few days of their
4 life, I would suggest it's that area, on the basis of
5 the evidence we have, which is purely, I repeat, evidence
6 based on the distribution of the animals during the
7 period that they're assumed to calve. I might -- I'm
8 not sure this would help, but I brought along copies
9 of satellite photographs, which show the extent of
10 the plume distribution, that is the distribution of water
11 ten degrees Celsius, or above, during the calving period,
12 in mid July, in a fairly good ice year; and another
13 photograph showing the same distribution of the plume,
14 taken in September, but representing the distribution
15 of the plume during a bad ice year.

16 Unfortunately, we just don't
17 have a satellite photograph taken in mid-July during a
18 bad ice year. Cloud cover, or whatever, meant that
19 photographs were not available; but this September
20 photograph does approximate the distribution of the
21 plume during bad ice year conditions, and I would offer
22 these if --

23 Q Well, perhaps they would
24 be helpful, and if Mr. Marshall doesn't object, perhaps
25 they could become exhibits.

26 (SATELLITE PHOTOS JULY 17, 1975 AND SEPTEMBER 18, 1975)
27 SHOWING PLUME MARKED AS EXHIBIT NO. 510)

28 THE COMMISSIONER: The plume
29 is observed because of the presence of silt within it,
30 that's how you can take this photograph, is it?

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1 A Yes, the photograph is
2 essentially of the turbidity, or the silt, that we
3 found through other surveys that the warm water
4 temperatures, warm temperatures correspond to the
5 plume very nicely. And the photographs show essentially
6 that the warm water extends many miles, out from the
7 mouth of Shallow Bay, and in fact when the distribution
8 of the plume is compared to the concentration area
9 of whales that we've observed over the four years, you'll
10 find that West Mackenzie Bay is a very important area.
11 It's warm, and appears to provide the physical parameters
12 required for calving and calf survival.

13 THE COMMISSIONER: So it is
14 on the strength of all of that that you suggest that
15 Shallow Bay may not be essential, that is access to
16 Shallow Bay may not be essential to post-calving
17 survival. That's really what it all comes down to.

18 A That's what it comes
19 down to.

20 MR. MARSHALL: Sir, the date is
21 at the upper left hand corner of the two sheets. Miss
22 Hutchinson has marked these two copies of the map as
23 exhibit 510. The first one is dated 17th, July, '75,
24 the second is 18th of September, 1973.

25 MR. BAYLY: I gather Mr. Webb
26 that the light colour is the plume, the lighter grey.

27 A Yes, it equates with
28 temperatures ten degrees or better, in fact up to
29 fifteen degrees Celsius, in July. The scale is not
30 marked on that. It's roughly one inch to twelve miles.

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Cross-Exam by Bayly

1 So that you can see the plume and the warm temperatures
2 extend quite a ways out. Unfortunately the crossing,
3 or planned crossing, is not marked on it.

4 THE COMMISSIONER: Well, we
5 know it well.

6 A I'm sure you would. I might
7 add, Mr. Commissioner, that I'm not advocating,
8 not withstanding my deductions and my opinion, I'm
9 not advocating that anything take place in Shallow Bay
10 which would deny over the long term the use of Shallow
11 Bay by the whales. I think that would be a mistake.
12 They certainly do attempt to get in there. They
13 perhaps would stay longer if wasn't for hunting pressure
14 from the seaward side, so it is reasonable to assume
15 that there could be some survival value, inherent in
16 Shallow Bay. What I'm saying is that one year's abstinence,
17 first of all it would not be an unusual circumstance
18 for them, and probably would not be of serious
19 biological consequence.

20 THE COMMISSIONER: Right.

21 A I might also add though
22 that this is dependent upon the availability without
23 disturbance of this West Mackenzie Bay area, and that's
24 why I'm very concerned, or was quite concerned, about
25 boat traffic through that West Mackenzie Bay area, one
26 of the reasons why I was concerned.

27 MR. SCOTT: Has Mr. Marshall
28 undertaken, Mr. Commissioner, to give us a detailed
29 account at some course of that load traffic, both before
30 the construction of the Shallow Bay crossing during and

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1 after. It obviously becomes critical in view of Mr.
2 Webb's evidence.

3 MR. BAYLY: I think that expands
4 on what I've asked for, but I think that under
5 the circumstances if we could ask Mr. Marshall to
6 include the before, during and after figures if they
7 are available.

8 MR. MARSHALL: We're dealing
9 with what traffic Arctic Gas proposes to have in this
10 area.

11 MR. SCOTT: Mr. Williams told
12 us last week, that it would not, as I understand his
13 evidence, that it would not be possible to construct
14 the Shallow Bay crossing, so as to avoid both the
15 whale period, that is, up to the middle of July, and
16 the staging period. There's going to be some overlap,
17 he made that perfectly clear. There is also going to
18 be, I presume, traffic preparatory to doing the work,
19 and to provide supplies and equipment, and personnel
20 and so on. It seems to me in view of Mr. Webb's
21 testimony, in which he's highlighted the risks in that
22 kind of traffic, and in view of Mr. William's testimony,
23 that there will be an overlap in these periods. We
24 should know precisely what we're facing, because without
25 that, we can't assess realistically whether there's
26 any risk to these whales or not.

27 MR. MARSHALL: We'll check
28 to see if we can provide you with some details as to
29 the boat traffic that Arctic Gas anticipates would be
30 involved in its construction of Shallow Bay crossing,

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1 both before and during and after the work's being done.

2 MR. SCOTT: A note for Mr.
3 Marshall, when he comes to lead his evidence in the
4 corridor phase, he'll perhaps be able to give us some
5 details about other traffic that will be in this
6 area as well.

7 THE COMMISSIONER: Well, what
8 you're concerned about, leaving the corridor out of
9 it for the moment, is whether say in the summer preceding
10 construction, you might be bringing pipe around from
11 Point Barrow and into West Mackenzie Bay, and tie --
12 and into Shallow Bay, and then tying up in the ice
13 until the next summer, that kind of thing.

14 MR. SCOTT: Well, it's really
15 more than that, Mr. Commissioner. The way we have parcelled
16 out the Inquiry, and it's inevitable, rather suggests
17 that, let us say, on July 1 there will be construction
18 commencing of the Shallow Bay crossing, and that it
19 will be carried on by men sort of, who are there, living
20 in tents, without contact with the outside world. It's
21 perfectly obvious that there is going to be water
22 transportation in and out, and there's going to be
23 air transportation in and out, and I would assume on
24 a regular, if not a daily basis, to the construction
25 site. If that's going to occur, in view of what Dr.
26 Gunn has had to say about aircraft flights, and what
27 Mr. Webb has had to say, he's spoken I think also of
28 aircraft flights; to realistically assess the risks,
29 we have to know how often Arctic Gas intends to bring
30 people in, when they bring in flights, or boats or

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1 ships, when they're doing construction work. Before,
2 during and after the program.
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MR. BAYLY:

Q Mr. Commissioner, we could add to that the places from which they are coming since it may be possible that boat traffic needs to cross or doesn't need to cross the critical areas.

A I think that's a very important point. In my discussions with Mr. Williams I was given to understand that except for the possibility of this gravel haul from Shingle Point, that the majority of the traffic that I would be concerned with -- about, with respect to the white whales would in fact be coming down Reindeer Channel or following pipelines to construction points that would essentially avoid whale concentration areas. So I was concerned about the gravel haul. I was given to understand that it need not take place during the period that the whales are in the west Mackenzie Bay. I don't mean to blunt your suggestion, I think it's a very good one, but we did discuss that and that was the assurance I was given.

MR. SCOTT:

I'm not asking Mr. Webb to tell us anything. I'm asking Arctic Gas to give their undertaking so that we can assess then whether the concerns that Mr. Webb has are met, and until Arctic Gas tells us what they propose to do, what in terms of volumes and numbers of trips, really all this evidence is interesting but somewhat academic.

MR. MARSHALL: It may ultimately be academic anyway because if you want to look at the whole picture, you have to look at what use native people are making of the area and how many trips there

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1 would be by outboard motor boats that might disturb
2 the whales and so on. That's not to say we won't do our
3 best , Mr. Scott. We will try to get the information
4 that you're asking.

5 MR. SCOTT: There's another way
6 it can be academic, and that's to go the other route.

7 THE COMMISSIONER: Well, in any
8 event, I think both of you are missing the point which
9 Mr. Webb and I both subscribe to, which is that it
10 would be nice to know what traffic you're bringing from
11 the west across Mackenzie Bay into Shallow Bay, because
12 that is where the critical calving area appears to be,
13 and if there is a lot of traffic there in the summer
14 before, and during the summer of construction, and
15 then if there is further traffic there related to other
16 construction connected with the pipeline, or if you
17 can't build this thing in one summer but you take two
18 summers ^{instead} to build it, all of those considerations should
19 be, so far as one can, taken into account.

20 The point you make about the
21 native hunters, Mr. Marshall, they apparently have been
22 taking something like 150 whales for a long, long time
23 annually, and the herd appears to survive. That's a
24 tolerable impact, and it is the incremental impact we
25 appear to be concerned with here.

26 Dr. Sergeant's proposal for a
27 whale sanctuary is a sanctuary that would be barred both
28 to the oil and gas industry and to the native hunters.

29 MR. MARSHALL: Well, we'll
30 certainly endeavor to get the full particulars, as you've

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1 requested.

2 THE COMMISSIONER: Well, let's
3 stop for coffee.

4 (PROCEEDINGS ADJOURNED AT 10:50 A.M.)

5 (PROCEEDINGS RESUMED AT 11:10 A.M.)

6 MR. MARSHALL: Mr. Commissioner,
7 Dr. Gunn has his slides ready and I've asked Mr. Bayly
8 if they might be shown now. He's agreeable to that.

9 WITNESS GUNN: Mr. Commissioner,
10 these slides relate to^a situation last fall where the
11 winter came early to the North Slope. There was a snow
12 storm that lasted from oh, late in the 4th of September
13 through to the 7th and on the 8th of September, as soon
14 as we were able to fly, we went out to look at the North
15 Slope, actually to fly transects to count geese, and
16 this first shot was taken near the north-western edge
17 of the delta out towards Tent Island, and you can
18 see that there is a flock of geese there down below
19 the highlands and over the water, they are flying
20 and in the air. There's open water for them but not
21 much in the way of sustenance. Next slide.

22 The North Slope itself looks
23 beautiful but it's no longer really goose country under
24 those conditions. These pictures, I may say, were
25 taken by my wife, who was in the aircraft with us.

26
27 We did find a few brant
28 geese, they still had to make their way along the
29 coast westward, and we came across a small flock. At
30 Komakuk the sky had cleared, the storm had passed,

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1 but this was an idea of the snow cover from the station
2 back to the mountains. On the way back we came across
3 a small group of white-fronted geese there, but still
4 in country that doesn't look very good for geese.

5 Back into the delta in the
6 area of Shallow Bay, as you can see, the snow cover is
7 not as deep and we began to run into the concentrations
8 of geese, as in this picture, and you can amuse your-
9 selves by guessing how many geese are in the picture.

10
11 Here is another one, you can
12 see Shallow Bay background and much less cover there,
13 of course, and the geese are able to stage and feed
14 in this area; and one more, the same sort of situation.

15 A flock over Shallow Bay it-
16 self, and finally this picture, taken by the projection-
17 ist, Bill Koski, in 1974 over Shallow Bay where you
18 have wall to wall snow geese, and he's counted those,
19 he says there are 1,400 in that slide. It looks more
20 than the number of geese in the other pictures, but
21 actually there are more geese in the other pictures.

22 Thank you, sir, that's all
23 I have.

24 MR. BAYLY: Q Mr. Webb, I
25 take it you agree with Dr. Sergeant that the noise
26 that disturbs whales, the most is that which is water-
27 borne, I suppose, as opposed to that which is airborne.

28 WITNESS WEBB: Yes.

29 Q And we can't therefore
30 completely extrapolate from whether whales are disturbed

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1 by aircraft, as to whether they will be disturbed by
2 boats or perhaps even Hovercraft?

3 A That's right, there are
4 different types of noise and different kinds of -- a
5 different potential for disturbance. However, we do
6 have some observations on each of the types with res-
7 pect to the artificial island construction logistics,
8 too.

9 Q Do whales react
10 differently to noise, as I understand, depending on
11 whether their route to escape appears to be on the
12 landward or seaward side of the cause of the waterborne
13 noise?

14 A Yes, that was a behaviour-
15 al trait first observed by Dr. Brodie in 1972 on the
16 first whale study, and it seems to have been borne out
17 by more recent observations.

18 Q And with regard to the
19 possibility of whales coming too close to the Shallow
20 Bay crossing construction site, do you agree with
21 Dr. Sergeant that there will be enough noise to scare
22 them away, or do you subscribe to Dr. Banfield's theory
23 that there should be an unwater alarm system?

24 A Are you referring to the
25 period of construction?

26 Q Yes.

27 A Well, my direct testimony
28 has been that they will approach to within one to two
29 miles of the crossing area during construction.

30 Q That would suggest that

Webb, Dabbs, Gunn, McCart
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1 an underwater alarm system might not be necessary.

2 A I would think it wouldn't
3 be necessary.

4 MR. HOLLINGWORTH: I'm sorry,
5 I didn't hear that.

6 A I would think it wouldn't
7 be necessary. I think Dr. Banfield's point of concern
8 was the possibility of whales moving past the construction
9 and being entrapped in the innermost portions of
10 Shallow Bay, being afraid to come back again or unable
11 to come back again. My view is that they probably would
12 not pass the area in the first place because of the
13 dredge activity, more so than activity on either shore.

14 MR. BAYLY: Q Is your under-
15 standing of the underwater alarm system something to
16 warn the whales, or something to warn people of the
17 presence of whales?

18 A I am really not in a
19 position to answer that.

20 Q Perhaps when Dr. Banfield
21 comes to talk about that.

22 A Right.

23 Q Now, do you have your
24 1975 report?

25 A No, I don't have a copy
26 with me.

27 Q Perhaps you can recall this;
28 on page 37 of that report you state about Hovercraft
29 and about boats in general on this page:

30 "The apparent variability and the reaction of

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1 whales to boats may be the result of a number
2 of factors. For example, water depth, nearness
3 to obstacles such as shallow water or land,
4 boat type, boat speed, traffic intensity,
5 recent experience of the whales, and whether
6 or not the whales are pregnant or accompanied
7 by a calf."

8 In the next paragraph:

9 "Slaney & Company personnel have never had
10 the opportunity of observing an encounter
11 between a Hovercraft and whales."

12 Have you talked to people that have? Any of the
13 hunters, for example, from Tuktoyaktuk?

14 A I haven't personally and
15 I can't recall that people have, who have worked on the
16 project, but I wouldn't want to rule out the
17 possibility.

18 Q All right. Are you
19 acquainted with Mr. Wayne Vogl, who I understand has
20 studied whale?

21 A Yes, as matter of fact
22 Mr. Vogl worked on behalf of F.F. Slaney Company in
23 1973.

24 Q I have a letter here
25 that we got a copy of last week from Mr. Vogl to Mr.
26 G.R. Douglas, the Director of Fisheries Operations,
27 Fisheries & Marine Service, in Winnipeg, and I have
28 a copy of that I'd like marked as an exhibit, Mr.
29 Commissioner.

30 (LETTER FROM W. VOGL DATED OCTOBER 28, 1974
MARKED EXHIBIT 511)

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And on the second page of that

report Mr. Vogl says as follows, and perhaps you can
comment on this:

"Since there is concern about the effect of
boat traffic and hunting activity on whale
movements, the following incident may be of
interest. On July 29th we accompanied a
hunting party to Hendrickson Island. No whales
were observed en route, so it was decided to
wait. On the morning of July 30th one animal
was shot between Hendrickson and Richards Islands
and butchered near Kidluit Bay. Because there
were three boats in our party, more than one
whale was needed to make the trip worthwhile.
The Inuit decided to wait in Kidluit Bay until
the beluga returned from deep water. Just as
the animals were observed coming around the
point, the Hovercraft moving north traversed
the water between Hendrickson and Richards Is-
lands. The beluga vacated the area and were not
seen until the following morning."

Now, would that be the sort of observation that you
would require to determine whether or not Hovercraft
would likely disturb whales?

A Yes, I would certainly
not argue with the conclusion reached or implied by
Mr. Vogl. I think it also suggests that the response
was not long-term in duration and that the whales
returned again, which I think is probably significant
in terms of effect of boat traffic and Hovercraft
traffic on whale.

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1
2 There is a danger of
3 course in using too many single incidental observations
4 and basing general conclusions on them without controls.
5 There could have been another factor involved. I'm
6 not suggesting there was in this case, but certainly,
7 I think you have to try to be aware of whether or not
8 there may have been some other factor that was affecting
9 whales at the same time.

10 Q All right. You being
11 a person that's acquainted with Mr. Vogl might be
12 able to discuss this with him, I suggest and add this
13 to your knowledge and perhaps find out if it was the
14 hovercraft or that in combination with some other factors.
15 If that is possible, perhaps you could indicate and
16 let us know if this increases the state of knowledge
17 on the possibility of hovercraft disturbance of whales.

18 A I'd be willing to accept
19 that it increases the state of knowledge at this point
20 in time.

21 Q Yes.

22 THE COMMISSIONER: Well, no
23 one is disputing that Mr. Vogl saw what he says he saw.
24 The question is, how lasting an impact did that distur-
25 bance have on the whales. Did it mean that they would
26 be likely to return in half an hour or never and your
27 whole -- your judgment would be that it would be a
28 temporary disturbance and not significant in itself.
29 The way you discussed it, that's certainly the implica-
30 tion I drew from your remarks.

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1 A Well, I drew that
2 inference from the last sentence that was quoted. I
3 think he implied that the whales returned the next day.

4 THE COMMISSIONER: Yes.

5 A Yes.

6 MR. BAYLY: Yes. I take it --

7 THE COMMISSIONER: But, excuse
8 me, if you had that kind of activity going on continuous-
9 ly, that is at least one -- the presence of one hover-
10 craft or more each day, then you could over a period
11 of June and July, the critical period in Mackenzie Bay,
12 have an impact on the willingness of the whales to
13 stay there and calve there. That's what this is all
14 about, I take it. That's what we're driving at here.

15 A Well, I think Mr. Commis-
16 sioner, this relates to the frequency of traffic as
17 well as the kind of disturbance and it relates back to
18 this business of what is an acceptable minimum of traffic
19 in terms of disturbance to whales which I rather
20 loosely referred to in my direct testimony. What
21 I could offer to do is to go back over our reports,
22 perhaps over the noon hour and this afternoon make a
23 statement as to the frequency and kind of boat traffic
24 that we observed going to and from the artificial
25 islands when we were studying the impact of construction
26 of those islands, in summarizing the response of whales
27 to the various kinds of boat traffic. I think in general,
28 there is a level of boat traffic that does not have
29 a lasting effect on the overall distribution of whales
30 within the warm water plume, but they respond in a very

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1 / short
2 / term to almost individual boats. At other times, they
3 come right up to boats, barges particularly and are
4 seen very close to them.

5 I'll attempt to summarize
6 this and to quantify what we observed, if you wish in
7 a statement this afternoon.

8 THE COMMISSIONER: Well fine,
9 I'm sure that would be helpful. You did point out that
10 the whales had the capacity to make a qualitative
11 distinction between outboards which they presumably
12 by experience, had learned were occupied by Eskimos
13 with rifles and the sound of tugs and barge, which are
14 benign white people just going about their business.
15 That sort of distinction, they had learned to make.

16 A That's right. There is
17 another distinction they make too, and it has to do
18 with the strangeness or the first time experience. They
19 react a little more to a new noise source, one that's
20 strange to them, than one that's familiar to them. In
21 other words, they can accomodate to stationary noises in
22 particular and to some boat traffic as well. So they
23 can not only distinguish but they can adjust over time
24 if they find that there's no -- I'm assuming because
25 they find there's no real danger presented by this
26 noise source.

27 MR. BAYLY: Mr. Webb, that's
28 one of the concerns, obviously, that various kinds of
29 boat traffic may disturb the whales, but one of the
30 other concerns that you've expressed in your evidence
and maybe exemplified by Mr. Vogl's letter and some of

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1 your own observations is that these kinds of disturbances
2 may affect the success of the hunt.

3
4 A Right.

5 Q This Hovercraft incident
6 may be one of those that affected the success of that
7 particular hunt?

8 A Apparently it did and I --
9 right. I think that's perhaps one of the most signifi-
10 cant points. Rather than affecting the survival of
11 whales it may well have an effect on the immediate or
12 day to day opportunity for killing whales by the natives.

13 Q All right. Then the
14 point that the Commissioner made, I think, that if there
15 were one Hovercraft per day that scared the whales out
16 of the area until the next morning, it might that in
17 that area, it would be impossible to continue the hunt.

18 A Yes. There may be an
19 adjustment however, to a regular or a regular and
20 frequent passing by of Hovercraft. I wouldn't rule out
21 the whales' ability to adjust to even that. Of course,
22 there are, I would think methods of controlling the kind
23 of traffic so that it would minimize the effect on the
24 hunt.

25 Q Right.

26 A Perhaps by allowing it
27 only at a certain time of the day.

28 Q One of Dr. Sergeant's
29 concerns was not so much that an individual company
30 may be constructing a pipeline crossing or that

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Cross-Exam by Bayly

1 individual hunters or groups of hunters may be hunting,
2 but that those two things combined with the building
3 of artificial islands, combined with offshore seismic
4 operations, combined with the supplying of Tuk Harbor,
5 combined with equipment going through the Husky Lakes
6 to dredge there, may, as a set of disturbances, dis-
7 turb both the whales and the hunt to such an extent
8 that they either leave certain areas or cannot be
9 hunted in certain areas or both. Is that the way
10 you've looked at the problem, or have you looked at
11 each possible disturbance individually?
12

13 A Well, our terms of
14 reference in each case have been to look at this par-
15 ticular industrial activity if you will. Usually these
16 terms of reference are determined by in consultation
17 between our client and the Land Use Committee and they
18 become operating conditions of the land use permit.
19 But, in each report, I think you'll find that we've
20 raised this possibility of a cumulative impact, which
21 we were not able to come to grips with.

22 I can only say that in later
23 years of the four year study program there's been more
24 than one island under construction at different locations
25 in West Mackenzie Bay and East Mackenzie Bay with boat
26 and air traffic back and forth and that, while there
27 in some cases has been an immediate response to the
28 activity on the part of the whales, the overall dis-
29 tribution of the whales within the estuary, within
30 the warm water portions of the estuary has not been

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1 materially affected as far as we are able to deduce
2 from the population data we have, the biological
3 consequences of that activity have not been serious.
4

5 Q Right. Well, isn't --
6 is it your opinion that the proposed sanctuary that
7 Dr. Sergeant has had outlined on the map is in response
8 to this cumulative effector the possible cumulative
9 effect. He doesn't appear to be worried about the
10 harvest of 150 whales a year per se, but that in
11 combination with the industrial activity that's pro-
12 posed for this region makes him think that a sanctuary
13 may be required which precludes both industrial activi-
14 ties and hunting?

15 MR. MARSHALL: Mr. Bayly,
16 you'll have to ask Dr. Sergeant what's in his mind.
17 I mean, he's given evidence about this. I don't think --

18 MR. BAYLY: Mr. Commissioner --

19 MR. MARSHALL: -- it's
20 fair to ask Mr. Webb what Dr. Sergeant meant.

21 MR. BAYLY: I'm asking Mr.
22 Webb, Mr. Commissioner, to comment on the sanctuary
23 set up by -- or proposed by Dr. Sergeant and if he
24 can't comment on it, let him answer that rather than
25 his counsel sir.

26 MR. MARSHALL:
27 Can you repeat your
28 question please?

29 THE COMMISSIONER: Well, that's
30 a -- the way you put it just now is slightly different
from the way you put it earlier and I see nothing wrong

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1 with asking Mr. Webb to comment on Dr. Sergeant's
2 evidence. Can I just put it to you this way? As I
3 understood what Dr. Sergeant was telling us, he said
4 that the presence of man, the extension of oil and gas
5 industrial activity throughout Mackenzie Bay might,
6 he may have put it higher than that, but let's just use
7 the word "might" for the moment, might drive the whales
8 out of their calving grounds with the passage of years
9 just as industrial activity at the mouth of the Churchill
10 River drove the whales away from the mouth of that river
11 for calving purposes, northward to the Seal River,
12 about 30 kilometers north.
13

14 He said if that occurred here,
15 you are in this very great difficulty, there isn't
16 other place to go because there is no comparable
17 estuary for calving purposes along the western Arctic
18 coast. Now, he said that if look ahead to the pro-
19 liferation of oil and gas activity throughout Mackenzie
20 Bay. He said that's what may very well occur and he
21 asked us to bear that in mind. A perfectly reasonable
22 thing to ask us to do. If I can -- you said earlier
23 you didn't disagree with anything Dr. Sergeant said
24 and I assumed when you said that that you weren't
25 quarreling with his concern about that progression of
26 events.

27 I take it that that something
28 that's occurred when the industrial activity has begun
29 to dominate or has asserted its presence in any estuary
30 anywhere in the world, whether it be the Mississippi

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1 or the Nile or the Churchill or whatever that river is
2 that comes out of Churcill. Is that the Nelson or
3 the Saskatchewan or --
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A Well, I'd be glad to comment on that. I think I perhaps should have said I basically agree with Dr. Sergeant's testimony as I've read it. I remain not entirely convinced that completely inviolate sanctuary is required to meet this possible set of circumstances that Dr. Sergeant is postulating. I tend to feel that this estuary, and the warm water conditions that the whales are seeking, are much greater in extent, well, it's a fact, they're much greater in extent than the Churchill River estuary. There is a possibility that they can move from one concentration area to the next, so therefore can adjust to some degree.

So the industrial activity would have to be very very extensive and very very intensive to bring about that condition that I think Dr. Sergeant's talking about. Much greater than has been experienced during our surveys; and I would also -- I'm not entirely convinced that a completely inviolate sanctuary is necessary in order to provide the control that may be required, to permit satisfactory use by beluga of the West Mackenzie Bay region; in other words, there may be other means of control, and perhaps some things can be allowed without inducing serious biological consequences, even in Mackenzie Bay; and I'm thinking in terms of such things as boat traffic.

We found that there is a minimum of boat traffic, both in type and frequency, that whales adjust to, and does not bring about serious biological consequences; and our evidence has suggested

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1 that whatever that minimum may be, is acceptable, in
2 terms of the safety if you will, of the whales, or of
3 the calves. So a completely inviolate sanctuary during
4 the open-water period and the closed-water period, is
5 one way of going about guaranteeing that the delta, or
6 the estuary will remain usable by the whales. There
7 may be other ways of controlling activity. More ways
8 more specific to the kind of potential disturbance
9 that has been postulated. I'm not sure if that's what
10 you -- the kind of comment you wanted Mr. Bayly.

11 THE COMMISSIONER: Could I just --
12 forgive me a minute Mr. Bayly, just let me pursue this
13 for a moment. He said that if you did, with the passage
14 of time, the accumulation of industrial activity in
15 the Mackenzie Bay; if you did drive the whales away, if
16 they didn't come in any longer to calve, in the same
17 way that they do not come in any longer to the estuary
18 of the Churchill River to calve; he said then there
19 is no place, no warm water estuary for them to calve
20 in the western Arctic, and of course, if the herd
21 doesn't reproduce, then the herd will disappear. He
22 said the Anderson River estuary wasn't large enough,
23 wasn't comparable to the Mackenzie, and it wouldn't
24 be satisfactory. Do you dispute that general line of --

25 A No, I think that logic
26 is quite correct, yes; and I further concur in that
27 the western part of the estuary seems to be of greater
28 significance than the other two areas where whales
29 have been seen to concentrate and apparently calve.
30 That's certainly true.

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Jakimchuk, Rowe
Cross-Exam by Bayly

1 MR BAYLY: Have you any indications

2 Mr. Webb, from your studies, that industrial activity
3 is moving the whales -- causing the whales to move
4 in an easterly direction earlier in the season than
5 they have previously done?

6 A No, we have no evidence
7 to suggest that. However, we really haven't studied
8 them in detail, after approximately mid-August. There
9 have been a few surveys to find out the direction of
10 dispersal from the estuary, but we haven't undertaken
11 intensive study past the date where they tend to leave
12 the estuary on their own.

13 Q When the Commission was
14 in Holman, the people gave evidence there that they
15 had seen beluga whales, close to home, and this was
16 a very unusual thing for them. Can you give us any
17 reason why that might have occurred?

18 A No I can't. I might say
19 though that there is evidence that distribution changes
20 under, what you might call, natural circumstances. An
21 example of that is that in one year apparently, and I've
22 forgotten the year, I can find the citation if you wish;
23 great numbers of whales actually used the deltas or
24 the estuaries of two rivers on the north side of Banks
25 Island, which had never been seen before, or noted
26 before, and has not been noted since, to my knowledge.
27 Now, this was a number of years ago, prior to
28 hydrocarbon exploration of any consequence, I'm sure;
29 and it may have been in relation to ice conditions.

30 We have noticed that, for

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Bayly

1 example, in 1974, which is accepted to be a bad ice
2 year, that not all the whales got into the Mackenzie
3 estuaries. In fact there was around half to two-thirds
4 of the regular number, and this incidence of their
5 use of Banks Island rivers may have been an example of
6 that kind of year, or perhaps even a tougher ice year.
7 So, certainly, their distribution is not always the
8 same in the Beaufort Sea, but what really causes those
9 changes is a matter of speculation, I think.

10 Q The people of Tuktoyaktuk
11 have stated as well that the whales appear to be leaving
12 Kugmallit Bay earlier in the past few years than they
13 ever remembered them leaving. Is that another question
14 that we have no real answer to, but can only speculate
15 about?

16 A Yes, most certainly. We
17 certainly don't have any evidence on that one way or
18 the other. Dr. Sergeant perhaps may have something on
19 that, because his visitations to the Mackenzie Delta
20 preceeded those of Slaney & Company by a number of
21 years, and he may have earlier evidence that we're
22 not aware of.

23 Q The evidence that you've
24 been able to gather though doesn't indicate satisfactorily
25 to you what the general patterns of distributions
26 and movements are. You've got too small a number of
27 years of observations to be able to say what these
28 distributions are.

29 A Well, outside of the
30 estuary I would say that's perfectly true. Within the

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Bayly

1 estuary we feel quite confident that we're charting
2 quite accurately their distribution between about
3 June 20 to August 15, thereabouts. And I might point
4 out that in the presence of the activity associated
5 with island construction, they have not left the
6 estuary until sometime in August. In other words, you
7 might expect that they would leave in July or perhaps
8 not stay at all, if in fact the industrial activity
9 was having a great impact; but they have spent indeed
10 some weeks each year, in the warm water of the estuary,
11 in spite of the boat traffic and in spite of the
12 dredging, and in spite of the aircraft to the islands.

13 Q Has your company done
14 either studies or literature reviews to determine the
15 level of industrial activity at Churchill that was
16 sufficient to cause the whales to leave their traditional
17 calving area, to see whether that compares in any way
18 with the proposed industrial activity in the Mackenzie
19 Bay -- Shallow Bay area?

20 A No, this alleged happening
21 was at least thirty years ago, and I'm afraid the
22 evidence is a little weak. There is not a strong piece
23 of documentation of what the whales were doing there
24 prior to the establishment of the port. It is assumed
25 that they were calving, and they may well have been
26 calving there. There is a report by Dr. Kenneth Doan,
27 then of the Fisheries Research Institute, I believe,
28 that indicated that whales stopped visiting the Churchill
29 River mouth for some short period of time, perhaps two
30 or three years, I've forgotten; after the establishment

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Bayly

1 of a port; but then re-appeared, and now, in recent
2 years, there's evidence that they do not calve, but
3 I'm afraid that the direct cause and effect situation
4 is still a bit cloudy, perhaps because of the number
5 of years involved, and the different people involved.

6 Q I assume we'd have the same
7 problem if the whales ceased to calve in the area of
8 Shallow Bay and Mackenzie Bay, in the next few years,
9 of actually pinning it down. That's something that's
10 very difficult to do under the best of circumstances.

11 A We'd be a little better
12 off, because we have some data as a background.
13 Unfortunately, it's not entirely complete, as we've
14 spoken of.

15 Q Well, is there any evidence
16 that you've been able to gather from anywhere in the world
17 that would suggest what level of industrial activity
18 anywhere has caused whales to relocate their calving
19 areas, or their nursery area?

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Webb, Dabbs, Gunn, McCart
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1 A None that I know of.

2 There's still a population of white whales in the
3 mouth of the St. Lawrence but I don't know its history
4 and I'm not sure if anyone has documented it. But
5 apparently they calve there and in the face of consider-
6 able traffic and human activity. But all we know
7 is that withstanding apparently to a level of acceptance
8 that seems suitable, the current level of industrial
9 activity and what the minimum might be before there is
10 a kind of complete departure that Dr. Sergeant hypothe-
11 sized is certainly not known to me.

12 Q Are you familiar with
13 any of the effects of drilling in the North Sea on
14 small whales?

15 A No, not personally.

16 Q Have you spoke to anyone
17 who has studied them? I understand there is a Mr.
18 Dean Fisher who has studied whales in the area of
19 drilling in the North Sea, and he's had something to
20 do with F. F. Slaney.

21 A Well, I know Dr. Dean
22 Fisher quite well personally. I'm not aware that he
23 did that research. I'll certainly ask him about it,
24 though.

25 Q I had understood that
26 he didn't study them but that he commented on a letter
27 that was addressed to either you or F. F. Slaney with
28 regard to the fact that they may have disappeared from
29 the area of drilling in the North Sea. Do you recall
30 that?

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 A No, I don't. I'm not
2 aware of it.

3 Q I understand we have a
4 copy of that letter that can be made available, Mr.
5 Commissioner, and we will make an effort to make that
6 available for Mr. Webb.

7 THE COMMISSIONER: Maybe you
8 can make it available to Mr. Webb at lunch time.

9 MR. BAYLY: I can't, Mr.
10 Commissioner, it's not in Yellowknife, but it can be
11 made available.

12 THE COMMISSIONER: Well, maybe
13 Mr. Webb could -- maybe, sir, you would phone Dr.
14 Fisher tonight (I assume this panel is going to be
15 here tomorrow) and just check that out with him. It might
16 be of some importance and worth commenting on while
17 you're here.

18 A Especially if the letter
19 is directed to me and I've forgotten it. I don't
20 think it was, but I'll certainly phone him and ask
21 him about it.

22 MR. BAYLY: Q Maybe just to
23 the company, I don't know. On page 10 of your
24 report, I think that's the 1975 one, you have related
25 how ice between Pullen Island and Richards Island
26 could act as a barrier to the movement between Mackenzie
27 and Kugmallit Bays for whales. Have you formed any
28 opinion as to whether the increased number of artificial
29 islands could slow down the movement of ice out of
30 the area and increase the magnitude of the barrier?

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 A No, we haven't.

2 Q Do you have any opinions
3 on that?

4 A No, no, I don't. I'm not
5 sure quite what the process would be. Perhaps you
6 could indicate who has developed that theory and we
7 could check it out.

8 THE COMMISSIONER: I think it
9 was Vincent Steen at Tuktoyaktuk.

10 MR. BAYLY: I suspect it
11 probably was.

12 THE COMMISSIONER: He's a
13 very knowledgeable gentleman, I might add.

14 A I know him and I would
15 agree. If you say it's Vince Steen I most certainly
16 will check it out.

17 MR. BAYLY: Perhaps you could
18 check it out. It may not be something that you can
19 answer because it's in the realm of theory, but I
20 take it that you can say that you haven't studied
21 the possibility of artificial islands acting as an
22 additional impediment to the movement of ice out of
23 the Shallow Bay-Mackenzie Bay area.

24 A No. As I mentioned
25 before, we've raised the flag of the possibility of
26 a cumulative effect of a number of islands, but we
27 have not really gone into what that may mean in terms
28 of -- well, ice or whales.

29 Q Dr. Sergeant commented
30 on it but only with regard to the movement of whales

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 in the open water season through channels between
2 islands, and you weren't referring to ice?

3 A No. We have studied
4 that as well, and with reference to Immerk, which was
5 the first island constructed by Imperial Oil and that
6 is in our 1972 report. We haven't speculated on great
7 numbers of islands in different locations. We're not
8 aware of where those islands may be, for one thing.
9 We certainly haven't done so.

10 Q With regard to Dr. Brodie's
11 report that you referred to yesterday, as I understand
12 what you said about any editing that you did, it was
13 to make it comply with the terms of reference basically
14 and to re-organize the paragraphing or structure of
15 it, that you yourself did to the Brodie Report.

16 A Yes, I think yesterday
17 I implied that I was the only one that edited it, but
18 that is not quite true. But I certainly had final
19 responsibility and accept that.

20 Q Right, and the part that
21 you excised from the report dealt with seismic opera-
22 tions that were not within the terms of reference.

23 A Yes, our program was to
24 monitor the construction of Immerk Island at that
25 time.

26 Q All right, that's not to
27 say that what Dr. Brodie may have had to say on the
28 effects of seismic operations on whales wasn't import-
29 ant, just that it wasn't what was asked for.

30 A Right, and it's not to say

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 that I disagreed with what he had to say on seismic.
2 In fact, re-reading that, I would say that I would
3 generally concur and did then.

4 Q Yes. A general question
5 as the final one to the panel as a whole. We've been
6 informed by Mr. Williams that he would be unable to
7 accommodate the construction of the Shallow Bay
8 crossing to all the possible concerns of the various
9 environmentalists who have specific species or areas
10 of the environment as their main concerns, and still
11 put in a double 36-inch line across Shallow Bay in
12 one summer. Now, Mr. Williams did seem to think
13 that they could put in a 36-inch crossing if they
14 waited until after the whales left the area and expected
15 to shut down prior to geese staging times. That's a
16 single 36-inch pipe. If that were to occur, I take
17 it that would then require an additional summer to
18 come back and put in the other 36-inch pipe. But
19 under those circumstances both the whales and the
20 geese staging could be avoided and if Mr. Webb and Dr.
21 Gunn could comment, please, on the possibility of
22 recommending to Arctic Gas that if they are to use
23 this route it might be preferable, at least from the
24 point of view of the whales and the birds, to construct
25 this crossing in two seasons rather than one, so that
26 they would be able to be more responsive to shutting
27 down operations when whales and geese were in the area.
28 Mr. Webb?

29 A Well, I'm
30 pondering that one, Mr. Bayly.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Bayly

1 Q Well, take your time and
2 perhaps Dr. Gunn could answer it, or perhaps he'd like
3 some time too.

4 WITNESS GUNN: I'd be glad to
5 answer it.

6 Q All right, sir.

7 A There is an additional
8 factor, as I understand it, in that before the
9 crossing can be attempted, a pad has to be prepared
10 on each side of Shallow Bay, and I understand the
11 plan to do that would be in the summer preceding the
12 actual construction of the crossing. So that your
13 plan would then mean some disturbance over three summers
14 not just two.

15 As far as preparation of the
16 pad is concerned, it can be done in August rather than
17 September, I think it wouldn't interfere with the
18 geese. As far as the geese are concerned, I feel that
19 if weather conditions permit, the construction of the
20 crossing could continue as long as is feasible for
21 the weather to work there. At least up until the point
22 that the geese are pushed off the North Slope because
23 of snow conditions. So that if that condition came
24 early in the year, which it might as far as we can see
25 perhaps once in eight years, then we would ask that --
26 we would recommend that construction cease at that
27 time. But if in the more normal event the geese were
28 able to make use of the slope until towards the end of
29 September, then we feel it would be acceptable to have
30 the construction continue up to that point, so that it

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Bayly

1 might be possible to finish in the one year; but if
2 conditions were bad then we would recommend a shutdown
3 till the following year.

4 Q Given your experience
5 with the test dredge that was carried out last summer,
6 have you any feelings about whether or not the opera-
7 tion could actually be shut down if they were trying
8 to complete it in one season?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

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2 A Oh, I don't think that
3 is a reasonable comparison. There will be proper
4 environmental inspectors on the job and we would
5 certainly recommend that this situation be watched
6 very closely and there would be a monitoring input as
7 to the what the situation is with the geese.

8 Q Mr. Webb, have you had
9 a chance to think about this.

10 WITNESS WEBB: Could I get
11 you to repeat the question for me, Mr. Bayly.

12 Q The question basically
13 is instead of one year to construct the Shallow Bay
14 crossing, it might make more sense to take two years
15 and have the luxury of being able to shut down when
16 both the geese and the whales that were in the area at
17 various times during the summer and early fall?

18 A If that's possible and
19 this would mean avoiding the time that the whales were
20 around, then I would think perhaps it would ^{have} some merit.
21 However, I have a feeling that it would be better to
22 get it over with in one year. That certainly the whales
23 would not be seriously affected in one year, but at
24 the same, I think the sooner that we can allow them
25 to go back onto Shallow Bay unobstructed, that the
26 better it would be.

27 Q As Dr. Gunn has pointed
28 out, it may actually be three years because the pad
29 has to be constructed prior to the season of stringing
30 the pipe and dredging.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Bayly

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2 A Yes, but not three years
3 in terms of whale effect because I understand the pad
4 construction to be considered for either August or
5 September when the whales aren't around.

6 Q Yes. Right. Any other
7 panel members have any thoughts on this? Perhaps,
8 Dr. McCart, I should give you an opportunity to speak
9 on this. This may be of concern to the fish.

10 WITNESS MCCART: Well, we've
11 made a general recommendation that the crossings, if
12 possible, be done in as short a period as possible,
13 one season. We would prefer that, although in the
14 case of Shallow Bay, I'm not as concerned as I would
15 be with something like East Channel. East Channel is
16 a far more productive and more important area from the
17 point of view of fisheries, whereas Shallow Bay is
18 relatively unproductive and heavily sedimented in an
19 area of deposition already, so my major concern would
20 be with other channels and not with Shallow Bay.

21 Q You'd like to see a more
22 very precise timing for the East Channel, the Moose
23 Channel and some of the others.

24 A Yes, I think a disturbance
25 over one season is going to have less effect than a
26 longer disturbance or where you have a similar dis-
27 turbance occurring over a period of years.

28 MR. BAYLY: Those are all
29 the questions that I have, gentlemen. Thank you
30 very much.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 CROSS-EXAMINATION BY MR. HOLLINGWORTH:

2 Q Gentlemen, when Mr.
3 Gibbs was cross-examining a previous panel relating
4 to technical evidence on the cross-delta route, he
5 referred them to exhibit 266 and specifically page
6 four, subsection C of a letter of transmittal from Mr.
7 Lee Hurd, when the documents were filed with Indian
8 and Northern Affairs and National Energy Board.

9 At that time, a reference
10 was made to additional environmental studies scheduled
11 for the fall and summer of 1975. The panel was unable
12 to say which studies those were and ask that the
13 question be directed to this panel and my question is;
14 are the studies listed in your document list, the
15 studies that are spoken of by Mr. Hurd, or are there
16 further studies?

17 WITNESS DABBS: I could perhaps
18 start by confirming that the reports filed, one
19 example, "The Vegetation Mackenzie Delta Area" by Reid
20 and Calder, December of 1975 is listed as a support
21 document to this panel, was in fact, a component of
22 the study that Mr. Hurd refers to in this statement.

23 Q That's the document that
24 you rely upon and the only document that you're
25 relying upon in giving evidence in this panel?

26 A Not the only document.
27 There's another one which I mentioned yesterday. The
28 progress report on rigs, "Site Seeding Tests in the
29 Machenzie Delta Region". This was a program that was
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
 Cross-Exam by Hollingworth

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ongoing and was not specifically referred to here but
 it is one that I'm relying on.

Q All right. Dr. Gunn?

WITNESS GUNN: We prepared a
 preliminary report prior to the filing of that state-
 ment, the date of which I understand is August, 1975.
 Mr. Hurd's statement. Since that time, we carried out
 our work in the summer of 1975 and have reported on that
 in the two documents which we have filed as exhibit or
 cross-delta route report; studies dated December '75,
 and January '76 and these are exhibits now.

Q Dr. McCart?

WITNESS McCART: We filed the
 preliminary report of the results of our 1975 studies
 and work is continuing on that and I expect we'll have
 a final report sometime before the end of April.

Q The preliminary report
 being the one you filed yesterday as exhibit 504?

A Yes.

Q Mr. Jakimchuk?

WITNESS JAKIMCHUK: We have
 submitted several reports, preliminary stages of reports
 regarding cross-delta; the first of which was prior to
 June 1974 when we did an initial assessment of that and
 subsequent to that, we conducted our field work in '75;
 submitted a draft in October. Another revised draft
 later in October and then a report in December that
 has been filed here.

Q That's Mr. Wooley's report?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A Yes. The first one
2 we ever did on cross-delta considerations was in --
3 prior to June of '74.

4 MR. HOLLINGWORTH: Has that
5 been filed, do you know, Mr. Marshall?

6 MR. MARSHALL: I don't know.
7 I remember that last summer, we distributed a bunch
8 of cross-delta materials and I don't ^{know} whether that in-
9 cluded all of the preliminary reports or not. There was
10 an environmental assessment -- preliminary environmental
11 assessment. Northern Engineering did it at that time.
12 That may have included those reports. I don't know.
13 We could check that though.

14 MR. HOLLINGWORTH: Thank you.
15 Mr. Webb, there don't appear to be any documents on
16 Mr. Hemstock's list that would support the testimony
17 you're giving. Which documents are you relying upon?

18 WITNESS WEBB: The three final
19 and one preliminary report covering the periods 1972
20 to 1975. "Whale Studies in the Mackenzie Estuary",
21 to paraphrase four different titles.

22 Q Thank you very much.

23 MR. MARSHALL: Those were filed
24 by -- as exhibits by Mr. Ballem in Inuvik.

25 MR. HOLLINGWORTH: Mr. Dabbs,
26 in revegetation plans for the cross-delta route, are
27 your planning to rely on native species or agronomic
28 species?

29 WITNESS DABBS: Current plans
30 are to rely largely on agronomic varieties.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 Q In this sense, then it
2 won't be much different from your revegetation scheme
3 throughout the route?

4 A In that sense, it's not.
5 It's restricted to a few varieties as detailed in the
6 report.

7 Q Will you be making use
8 of any native varieties at all in your cross-delta
9 revegetation?

10 A As I pointed out to the
11 Inquiry before, it is our hope and intention to use
12 native species and varieties as the seed sources
13 available.

14 Q You've given that testimony^{at}
15 the Inquiry as related to the rest of the route. I'm
16 asking about the cross-delta route at this time, Mr.
17 Dabbs. Is the answer still the same?

18 A Yes, we very much hope
19 to be able to use natives.

20 Q Dr. McCart, have you
21 come to any conclusions as to the impact the cross-delta
22 route will have on benthic macro-invertebrates
23 from a siltation point of view?

24 WITNESS MCCART: Oh, a general
25 conclusion that the area is heavily silted in most
26 instances in any case and that there is unlikely to be
27 any significant long-term effect on benthic
28 invertebrate populations.

29 Q My advice^{is} that Brunskill
30 concluded that some of the benthic fauna in this area

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 were highly susceptible to siltation and he expressed
2 fears that extra siltation could, in fact, damage the
3 benthic fauna. What are your views on that?
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A I did bring up the case
2 of East Channel. Now apparently there is a somewhat
3 higher population of benthic ^{invertebrates} in the East Channel, than
4 in places like Shallow Bay, where there's pretty much
5 a continuous silt covering, but in the higher velocity
6 sections of some of the channels, yes, there is
7 relatively clean gravel. My feeling is still that
8 we're not going to have any significant effect even on --
9 in the sense that the total area that might be damaged
10 over a short period of time is going to be an insignificant
11 proportion of the total of area available for
12 colonization by those animals.

13 Q Now you make in your --
14 excuse me -- ^{are} /you make in your observations of the
15 crops in the various channels on the basis of the studies
16 that are contained in Exhibit 504?

17 A Our own studies, and in
18 combination with the data which are presented by
19 Brunskill et al in this volume here.

20 Q But I take it that as
21 regards the effect of silt, you're in disagreement with
22 Brunskill's conclusion.

23 A No, I wouldn't disagree.
24 I suspect that probably there will be some -- obviously
25 if you coat a bottom, you're going to have a diminution
26 in the population of benthic ^{invertebrates} if they happen
27 to ^{be} /animals which are susceptible to sedimentation.
28 My argument is, however, that this will not be a very
29 large area that would be affected, and if it is affected,
30 it would be only for a very short period of time.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 Q Have you made a study
2 as to how great an area might be affected in each of
3 the channels that Arctic Gas proposed to cross?

4 A We are attempting to get
5 some information, based on what is known of grain size
6 and things of this sort, for those channels, as to
7 what distance downstream we can expect sediments to
8 be carried, but we don't have that information yet.

9 Q Can we expect that in the
10 April report that you promised us?

11 A No, I hadn't planned on
12 putting it in there. We have indicated our concern
13 about this, and we have indicated to hydrologists at
14 N.E.S. that we would like to have this information if
15 possible, but we don't have it yet.

16 Q Is that study going to
17 be carried out in order to provide you with that
18 information?

19 A My understanding is that
20 some calculations will be made, and we will have some
21 indication of what we can expect as far as downstream
22 carrying -- the distance downstream that we can expect,
23 let's say, 90% of the sediments to be deposited.

24 Q Have you been advised when
25 you can expect this information?

26 A No.

27 Q Can you find that out?

28 A I think so, yes.

29 Q And could you also find
30 out when you might be in a position to reach some

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 conclusions, and give them to the Inquiry?

2 A Conclusions with regard
3 to what?

4 Q With regard to the --
5 you're going to make conclusions as I understand it,
6 having obtained the silt levels from N.E.S., you're
7 going to make some conclusions as to what the possible
8 effects could be on the benthic fauna. Do I have it
9 correct?

10 A Yes, but I don't think
11 that we can do any more than generalize about it,
12 without actually doing experimental work. We can say
13 that -- okay, within a distance, such and such a
14 distance downstream, certain kinds of organisms, if
15 they happen to be present, are going to be affected.
16 I should point out while it's true, that there are
17 probably populations of things like May flies, and
18 stone flies, in these major channels, that the bulk
19 of the populations in these channels are made of
20 chironomids and oligochaetes, which are extremely
21 tolerant of silt; so that --

22 Q Let's try that slowly.

23 A No, I'm trying to say that
24 most of the organisms that you find there are in fact
25 silt tolerant, or they wouldn't be there.

26 Q So you don't even plan
27 to make these general views available to us, is that
28 your --

29 A Oh yes, I think those
30 general views will be expressed in the discussion of

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 our report when it's completed.

2 Q Is this the April report,
3 or/^alater report?

4 A No, it will be a portion
5 of the final report for our cross-delta studies, which
6 I expect to have available towards the end of April, or
7 possibly early in May.

8 Q Now, in your report which
9 has been filed as Exhibit 504, it/^{is}stated that benthic
10 macro-invertebrates are not dense along the cross-delta
11 route. That is your testimony.

12 A Yes, yes.

13 Q And your testimony also
14 it that they seems to be densest in the East Channel,
15 of the crossings that are going to be made. What fall
16 into the definition of -- your definition of macro
17 benthic invertebrates. Are they set out in toto, in
18 the chart that's contained on page 26 of your report?

19 A Could I see the chart please?
20 That includes those groups of benthic and macro-
21 invertebrates which we have taken in our studies, along
22 the cross-delta route. Benthic macro-invertebrates can
23 be defined in a number of ways. We are currently using
24 the EPA definition from the United States, which states
25 that they are those bottom dwelling organisms, which
26 are retained by a specific sieve size.

27 Q Well, it appears that
28 isopods are included in your list there.

29 A Yes.

30 Q Well, what about pelycepod?

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1 A What about them?

2 Q Are they included in that
3 list?

4 A We haven't included them
5 on here, possibly we didn't get any in our samples. If
6 they had been taken, presumably they would have been
7 included, because they are included within our definition,
8 yes.

9 Q Well, you say presumably,
10 you don't know for sure whether they'd be included or
11 not if they'd been found?

12 A They are -- we consider
13 them to be benthic macro-invertebrates, and they would
14 have been included.

15 Q That chart also seems
16 to indicate -- tell me if I'm not reading it correctly --
17 that only in Moose Channel did you find isopods.

18 A Yes, that's what it
19 indicates.

20 Q I'm advised that some
21 research conducted by Dr. Percy, found that the main
22 items in fish stomachs, along the proposed Arctic
23 Gas route, were in fact isopods and pelycepods. Are
24 you familiar with that document?

25 A No, but I should point out
26 that we're not saying that isopods don't occur there.
27 Certainly isopods are one of the dominant species in
28 SHallow Bay, for instance, in certain parts of Shallow
29 Bay. All we're reporting is what we got in our
30 samples. There have been other studies, other

1 extensive studies; we're aware of them. Brunskill et
2 al is one of them, Percy is another. We don't purport
3 to have undertaken a detailed study of benthic
4 invertebrates here, our major focus was on fish
5 populations. I should also point out that Dr. Percy
6 has not worked from the Shallow Bay area, his work was
7 confined to the east of that area largely, and not to
8 the western area.

9 Q Well, let's just go back
10 a minute, Dr. McCart.

11 A Which includes Moose Channel

12 Q Don't fish feed on
13 benthic invertebrates?

14 A Yes, they do.

15 Q They're^{an} important food
16 source for them.

17 A Yes.

18 Q But you haven't done
19 a detailed study on the sources of food of these fish,
20 just on the actual populations.

21 A Well, let me go back. We
22 know what the fish are eating, because of course we
23 have examined hundreds of stomachs. I think we have
24 a pretty good idea along with Dr. Percy of what they're
25 eating.

26 Q Well, I'm a little puzzled
27 here. You did some studies along the route, studying
28 benthic invertebrates, presumably to study what
29 density they were found in, in these various channels
30 that the Arctic Gas pipe proposes to cross. You found

Webb, Dabbs, Gunn, McCart,
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1 very few isopods and yet now you say that they're a
2 dominant food source for fish along the route.

3 A I didn't say that they
4 were a dominant food source. Dr. Percy said that. I'd
5 have to check our notes and see whether in fact they
6 are a dominant food source for fish along the route.

7 Q Do you know now?

8 A I have the data, yes.

9 Q Well, could you agree or
10 disagree now, or would you have to look it up?

11 A I'd have to look it up.

12 Q Could you get the answer
13 and provide it after lunch break then?

14 A Yes. Let me point out one
15 other thing, that these are migrating fish, and that
16 what you find in their stomachs may have been picked
17 up some distance from where you actually caught the
18 fish. A large proportion of the fish that are moving
19 through these areas at least are in migration.

20 Q Well, may I ask what the
21 purpose of your research was on benthic invertebrates,
22 if you were studying the actual fish supply and not
23 the benthic invertebrates?

24 A Our reason for looking at
25 benthic invertebrates was to more or less corroborate
26 what Dr. Brunskill was able to demonstrate, that his
27 is not a highly productive area in the sense that you
28 have a relatively low density of benthic invertebrates,
29 whatever they happen to be, along the course of this
30 route, so that we now have a basis for comparing the

1 benthic invertebrate densities along this route, with
2 benthic invertebrate densities along the North Slope,
3 down the Mackenzie Valley, and various and sundry kinds
4 of streams. It was not a major focus of our studies.

5 Q Do you feel that you
6 corroborated Brunskill's studies, in the studies you
7 did?

8 A Our figures are quite
9 close to his. His Eckman dredge samples and ours
10 correlate, relatively closely.

11 Q Well I understand sir,
12 and perhaps you could turn to page 27 of that report.
13 That the values that you came up with were something
14 like were something like five to six times greater
15 than those found by Brunskill.

16 A Page 27?

17 Q Yes sir.

18 A For one channel -- Moose --
19 West Channel, yes. Now I might point out that
20 West Channel is a considerable length of stream, and
21 that we concentrated our efforts at the crossing site,
22 and that it's quite conceivable that we could come out
23 with the value for our samples from West Channel
24 which are five to six times greater than his.

25 Q Well, at least in West
26 Channel then, your figures certainly don't corroborate
27 those of Brunskill.

28 A In general, however, they're
29 fairly close. The other thing is of course --

30 Q Dr. McCart, they're five

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Hollingworth

1 to six times as great.

2 A I doubt that we could
3 demonstrate that there is a significant difference
4 as possible, because of the range of variation that
5 one gets in natural populations of benthic macro-
6 invertebrates. I'm not denying that the West Channel
7 samples that we took show a greater density than
8 Dr. Brunskill's, and we point that out, but in general
9 he had very low values, or our values for other areas
10 are comparable to those that he obtained.

11 Q Well, maybe I missed it,
12 but perhaps you could direct me in that report to areas
13 where your figures corroborate those of Dr. Brunskill?
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A I could look that up.

Q Would you let me know
that after the lunch break, too? Sir, I'm going
to go onto another line of questioning. I don't know
whether you want to terminate at this time.

THE COMMISSIONER: All right,
we'll adjourn till two o'clock.

(PROCEEDINGS ADJOURNED TO 2 P.M.)

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(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. SCOTT: Mr. Commissioner,
I think we are all ready to proceed.

MR. MARSHALL: Mr. Commissioner,
I spoke to Mr. Webb, and he undertook to try to get
something together over the noon hour on the movements
of barges and boats and so on through the artificial
islands. He'd like a little more time to work on
that, if he may, sir, and respond to you tomorrow
morning.

I think Dr. McCart has had
some time to look into a few matters that were raised
this morning, and if you wish, sir, he can comment now.

MR. HOLLINGWORTH: Maybe
before Dr. McCart gets into that, I might add that he
and I have been discussing this matter over the lunch
hour and we are misunderstanding one another. He seemed
to feel that -- I beg your pardon, Mr. Scott?

MR. SCOTT: It was a joke.

MR. MARSHALL: It's all right,
I find that Mr. Scott periodically has to say something.

THE COMMISSIONER: Well, let's
go.

MR. HOLLINGWORTH: In any
event, Dr. McCart apparently understood me to say that
my understanding was that certain benthic crops were
highly susceptible to increased silt loads, and I was
really directing my question to overall benthic crops
and their reduction from increased silt loads. Perhaps
with that in mind he might attempt to answer the

Webb, Dabbs, Gunn, McCart
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questions that were left over to him.

WITNESS McCART: Yes, the point that Brunskill et al were making was that if you look at streams within the Mackenzie drainage and Porcupine drainage you find that those with the highest silt loads also have on the average the lowest standing crops.

I'd like to go back to the other question. The paragraph, the offending paragraph in this report of ours; I want to point out that this is a preliminary report. It hasn't been heavily edited yet. Can I read the paragraph and then point out what I think it's supposed to mean?

Q By all means.

A

"These data follow the same basic pattern described by Brunskill et al , 1973. Benthic invertebrates were more abundant in lakes and channels and were least abundant in the predominantly fresh water estuaries. The samples obtained during this study do, however, show a denser benthic fauna in West Channel, 955 organisms per meter squared than that reported by the above authors', 165.7 organisms per meter^{squared} at sites further upstream in the same channel. In both instances samples were obtained with a modified Eckman dredge."

Now the paragraph is a little sloppily worded and I

Webb, Dabbs, Gunn, McCart
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1 think it should be worded:

2 "These data follow the same basic pattern
3 described by Brunskill et al, 1973, who found
4 that benthic invertebrates were more abundant
5 in lakes and in channels, and were least
6 abundant in the predominantly freshwater
7 estuarine regions."

8 We did not in fact examine estuarine regions. We are
9 simply describing the pattern ^{that} Brunskill and his
10 fellow workers ^{found.} We did, however, look at a lake and
11 compare it with our channel samples and we found the
12 same general pattern, that the lake -- in the lake
13 there were far more benthic invertebrates per square
14 meter than in the channel, so that we are corroborating
15 Brunskill's finding in that.

16 I want to make further the
17 point that I made earlier, that we did not set out
18 with the intention of doing detailed benthic invertebrate
19 and macro-invertebrate work as part of our study. It
20 was almost entirely concentrated on fish. However,
21 because the only data available for the western portion
22 of the cross-delta route were for a single point on
23 the West Channel, approximately I think 20 miles ,
24 Brunskill's samples came from a point which was below
25 the juncture of Moose Channel and West Channel, which
26 is a considerable distance from the crossing which we
27 were interested in. The fact that we found more than
28 him may or may not have any significance statistically.
29 We would have to go back and look at the actual numbers
30 in each of the ten samples we took and compare them to
the numbers he found in

Webb, Dabbs, Gunn, McCart
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1 his samples to find out whether they were statistically
2 significantly different. But the fact that he found
3 fewer than we did at stations 15 miles apart is not
4 terribly meaningful unless we know an awful lot more
5 about the conditions at the site where he took his as
6 compared with the conditions at the site at which we
7 took our samples.

8 Q May I ask you again
9 then, why did you bother to measure these invertebrates
10 at all?

11 A Because if you look at
12 Brunskill's study -- and I ^{have} maps of his collection
13 areas -- you'll find that almost all of his information
14 is for channels in the east, for freshwater locations
15 in the east, including channels and lakes, and we
16 felt that it would be worthwhile to have some further
17 information just in a general way for the western por-
18 tion of the route, including Shallow Bay, and several
19 other locations to the west.

20 Q Well, that gets back to
21 my original point. It is a very general study, isn't
22 it, Dr. McCart?

23 A The benthic macro-inver-
24 tebrate portion of the study is very general exactly,
25 and we don't make any claim that it's anything more
26 than a very general, very superficial look at benthic
27 macro-invertebrates, yes.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
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Q Because you found
scarcely any isopods or pelyceps and Dr. Percy
found a lot them in fish stomachs.

A Yes, but again, Dr.
Percy's samples did not come from the west portion
of the channel. I'm quite prepared to accept the fact
that in Dr. Percy's sample area, he found them, we
didn't. That's the way it is. You can only report
what you find in your own samples. I mean, if they
don't appear in your sample, you can't put in a column
for pelyceps and invent some numbers and put ^{them} in there.

Q I'm not suggesting you
do that, Dr. McCart. I am suggesting that your study
is superficial at best.

A Ah no, I think, you see,
there's no doubt that our study of benthic macro-
invertebrates is superficial, admittedly. However,
there are other data available, which we will discuss
when we get around to preparing our final version of
this report.

Brunskill and Percy -- or
Brunskill at least and his co-^{workers} have spent an
awful lot time and an awful lot of money looking at
benthic macro- invertebrate populations. We're
willing to accept their data. Unfortunately, there
were some gaps in the western portion. We've looked
at that --

Q Do you think --

A --admittedly, in a
superficial way. Can I put this in perspective?

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Hollingworth

1 Here in Shallow Bay, for instance, we're talking about
2 something like 57 organisms per meter squared. In many
3 of -- or in some of our samples, we have got almost
4 nothing; maybe one or two or zero organisms. That's
5 a very, very, very low number of organisms. If you're
6 looking at a stream like Vermilion Creek or some of
7 those streams that drain into the Mackenzie River in
8 the vicinity of Norman Wells, you're talking of numbers
9 from 800 up to four or 5,000. In some of the springs
10 across the North Slope, we have counted as many as
11 120 thousand organisms per meter squared. Macro and
12 benthic, macro-invertebrates.

13
14 When we're talking about
15 Shallow Bay, we're talking about what is essentially
16 a desert from the point of view of benthic macro-
17 invertebrates. There are very, very few out there.

18 I don't think that you're
19 going to have very much effect on the total population
20 of benthic macro-invertebrates. They're rather sparse
21 to begin with. The area that they inhabit is relatively
22 very large. The area that will be disturbed by any
23 kind of trenching or sedimentation is likely to occur
24 as a result of this pipeline construction is very tiny
25 in comparison to the total area available.

26 Q But isn't the fact that
27 the population of benthic macro-invertebrates so small,
28 all the more reason to be concerned because you're
29 cutting down an already small population, no matter
30 how insignificantly in your judgment?

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Hollingworth

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2 A The ones that do occur
3 there are ones that are they because they are adapted
4 to those kinds of conditions. They're adapted to the
5 fact that Shallow Bay cuts back 30 feet every year.

6 Q Well, you're satisfied
7 in that your superficial studies have established
8 that they are highly resilient?

9 A Our superficial studies
10 haven't looked at the resilience of these things. What
11 I think from the literature we can be fairly certain,
12 that, yes, they're fairly resilient to sedimentation,
13 otherwise they wouldn't be there. The sorts of organ-
14 isms one finds there are not the sorts that are adapted
15 to clean water areas.

16 Q Could I ask the panel?
17 I guess Mr. Rowe would be the man to answer this and he
18 possibly would want to take under advisement. We've
19 heard considerable evidence about the possible revetment
20 of 7,000 feet approximately of the west side of Shallow
21 Bay. I wonder if the Inquiry could be told exactly
22 where this revetment would begin and exactly where it
23 would end and possibly a map could be provided or it
24 could be shown on the map that's on the wall now.
25 Would that be possible, Mr. Marshall?

26 WITNESS ROWE: I don't have
27 that information with me, Jack. Perhaps we can get it.

28 MR. MARSHALL: : The panel
29 we had last week is the one. I don't know that they've
30 determined this. I can check with Dr. Clark and Dr.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 Hollingshead and see if they know.

2 MR. HOLLINGWORTH: Thank you.

3 Now, as I understand it Dr. McCart, your study upon
4 which you rely generally locates a few rearing sections
5 of the delta for fish, but it doesn't really come to
6 many conclusions about migration and overwintering
7 areas. Is that a fair statement?

8 WITNESS MCCART: Well, we
9 provide what information we were able to gather on
10 migrations through the area. The version that you
11 have does not include very many conclusions, no, about
12 impact but that we expect to come in the final report.

13 Q Is the study that you're
14 going to produce in April or some time after that,
15 going to reach more conclusions?

16 A Well, I think possibly,
17 it'll relate both our data and other people's data
18 to impact more closely than the study that you have and
19 I'll have. Remember, there is an awful lot of other
20 information, particularly for the east side of the
21 delta.

22 Q For instance, do you
23 have any idea at all, roughly what numbers the fish
24 would use the various channels leading into the delta?

25 A As migration --

26 Q Yes.

27 A -- pathways? No, we
28 don't have any idea of the numbers.

29 Q It follows from that that
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 you wouldn't have any idea of the proportion using
2 each of the channels.
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A No.

2 Q Even the major channels?

3 A That's correct, yes.

4 Q Were you attempting to

5 get this information?

6 A No. We feel that it's
7 an extremely difficult job, and I think we discussed
8 this before, that some species, you might be more
9 damaged by attempting to get that kind of information,
10 for example, ciscoes, which are rather delicate,
11 high mortality it seems to me, trying to get that
12 information than you do by simply carrying on with the
13 job of construction.

14 Q Would you consider it
15 useful information to have in making your -- giving
16 your advice to Arctic Gas?

17 A I don't think that it's
18 essential, no, that we have it. I think what we have
19 to do is design the projects, so that you're not going
20 to damage fish populations regardless of what the
21 number might be.

22 Q Are the fish using the
23 upper Mackenzie, also use the delta, either for
24 migration or over-wintering, or for anything at all?

25 A Yes.

26 Q And, do you know where --
27 which routes they use for migration?

28 A Well, in a very general
29 way. We know that there are major migrations up East
30 Channel. We know that there are migrations up West

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Hollingworth

1 Channel and Moose Channel. Likely the fish that are
2 going to the Peel River and the Big Fish River and
3 the Rat River tend to use those channels in the
4 western part of the delta, to a greater extent,
5 particularly this would be true of the Arctic char.

6 Q Would you be happier if
7 you had that information, in more than a general sense?
8 In making recommendations to Arctic Gas?

9 A I don't think it would
10 make very much difference. As I say, we have to design
11 the project to protect the fish using any of the
12 channels, regardless of what proportion of them use
13 it.

14 Q You were saying fish use
15 the delta for over-wintering?

16 A Yes.

17 Q Do you know where?

18 A It would appear that they're
19 more or less generally distributed, but it's very
20 difficult kind of information to get.

21 Q Well again --

22 A I think we have to presume
23 that they're likely to be anywhere that there's water
24 with sufficient draft and sufficiently high oxygen;
25 that we have to make the presumption that there are
26 likely to be fish overwintering in the vicinity of
27 any winter crossing.

28 Q In making your
29 recommendations to Arctic Gas, would you feel more
30 comfortable if you had that information, in more than

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 a general way?

2 A Well, as a matter of fact,
3 we have suggested that as part of the final design, there
4 should be more work done, to determine whether there
5 are any large concentrations of fish immediately
6 downstream of any of the proposed winter crossings, so
7 that at some point in the future, we will in fact go
8 back; and if there appears to be an area which might
9 be a critical overwintering habitat, we might suggest
10 a change in the alignment, or some change in the timing
11 of the crossing, or something of this sort, in order
12 to mitigate any potential effects.

13 Q Was that suggestion
14 accepted as yet by Arctic Gas?

15 A I don't know that I have
16 any specific letter accepting this, but it's something
17 that we have mentioned on a number of occasions.

18 Q Who did you mention this
19 to?

20 A Mr. Hemstock, among others.

21 Q And is he agreeable to
22 carrying this out?

23 A He hasn't said no,
24 certainly. As I said, he hasn't specifically put
25 anything down on paper agreeing to this recommendation.

26 Q I assume from that that he
27 hasn't said yes either.

28 MR. MARSHALL: Why don't you
29 ask Mr. Hemstock, who should be here tomorrow?

30 MR. HOLLINGWORTH: Well, he's

Webb, Dabbs, Gunn, McCart,
Jakimchuk Rowe
Cross-Exam by Hollingworth

1 talked to the witness , he's answering the questions
2 now. Surely he's in a position to answer my question.

3 A It's difficult to know
4 whether he said yes or not. I can't remember.
5 I think he accepts the necessity of this, yes.

6 Q All right, now you, I think
7 still got the exhibit 504. I'm afraid there are a few
8 copies of that flying around, and I believe that on
9 pages 7 and 8, or perhaps it's 8 and 10, there are
10 maps of the stations, where you performed your studies.

11 A Yes.

12 Q How were these stations
13 selected?

14 A Well, in part it had to
15 do with ease of access. They were confined almost
16 exclusively to the pipeline route. We looked at lakes
17 and things of this sort that we thought were -- might
18 potentially be affected. We didn't attempt to look
19 at absolutely every water body along the route, but
20 we have a fair sampling.

21 Q Well, if I'm not mistaken
22 for instance, Dr. McCart, number 4 is off the map.

23 A Lake number 4?

24 Q The site number 4, the 4
25 in the circle.

26 A Yes.

27 Q Why -- why was that
28 selected, that particular point?

29 A That lake itself is
30 relatively close to the pipeline. Are you talking about

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 off the alignment sheet or off the map?

2 Q I thought it was off the
3 map, maybe I'm mistaken.

4 A No, it's on my map here.

5 Q All right. Site number 3
6 appears to be some distance off the route. Do you
7 know how far that is off the route?

8 A Well, I have the alignment
9 sheets here, we can take a look at them.

10 Which site was that, number
11 3?

12 Q That's number 3.

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Webb, Dabbs, Gunn, McCart
Jakinchuk, Rowe
Cross-Exam by Hollingworth

1 A It looks like to me
2 like the lake at site No. 3 may be as much as 100 yards
3 off the pipeline route.

4 Q All right then, what
5 about at the other end there's a site well up in
6 Yaya Lake. Was that possibly picked because of the
7 nearby gravel site?

8 A That was chosen because
9 there are really two basins in Yaya Lake, and that
10 site is within a clear oligotrophic basin and the
11 other site within the portion of Yaya Lake that is
12 flooded annually and is turbid, and that's the reason
13 we went that far, so that we could get some comparison
14 of the two portions of the lake. I must admit, incid-
15 entally, that we did not do a great deal of work on
16 Yaya Lake because Slaney had already preceded us and
17 provided us with a considerable amount of information
18 on that lake.

19 Q Now during the technical
20 evidence the panel was uncertain whether 340,000
21 cubic yards of gravel might be put on top of the
22 pipe as a form of backfill in Shallow Bay. Were you
23 aware that this was being considered by the engineering
24 people?

25 A That gravel backfill
26 might be used in Shallow Bay?

27 Q Yes.

28 A Yes.

29 Q And what is your view
30 on that?

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A I would suspect that
2 it will provide a very favorable habitat for benthic
3 macro invertebrates and that in the gravel over the pipe
4 that you're going to find that populations are conside-
5 rably increased over what you find on either side.

6 Q What about after it
7 silts in?

8 A Well then of course the
9 advantage would be lost.

10 Q So that the advantage
11 lasts as long as the silt doesn't fill it in?

12 A That's right.

13 So that the advantage is
14 going to be extremely short-lived, I would imagine.

15 Q All right. On the last page
16 of your evidence, on the previous page it talks about a
17 lake which lies astride the pipeline route?

18 A Yes.

19 Q You say,
20 "It can't be avoided although minor alterations
21 in the crossing site are still possible."

22 A Yes.

23 Q You say,
24 "We have recommended that this lake be the
25 subject of an intensive investigation to
26 ensure that the alignment does not interfere
27 with potentially critical areas such as spawning
28 beds and overwintering areas."

29 Do I understand from that that if you looked at the
30 precise alignment that was given to you, and this

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 assumes that Arctic Gas approves that you go ahead
2 with this program, and find any potentially critical
3 spawning beds or overwintering areas that you will
4 change the alignment within that same lake?

5 A Well, we discussed this
6 at some length with Mr. Williams. Now he tells us that
7 with the alignment that they presently have, that it
8 would be extremely difficult to change the routing
9 sufficiently to totally avoid that lake, because you
10 would be getting into more difficulty with difficult
11 channel crossings and things of this sort. Our argument
12 to him was that, "Well, if you must go through the lake,
13 can we -- we've got to be assured that you're not
14 passing through some critical feature such as a gravel
15 bed which might be a spawning area, or through a deep
16 hole which might be utilized as an overwintering
17 area, and that in fact if they had to go through there
18 we should in fact go in and determine through diving,
19 netting, and things of that sort, whether in fact
20 there might be a critical area right on the pipeline
21 route. If so, can we move it? And if so, how far
22 must we move it in order to avoid such an area?"

23 I should point out we have
24 gone to that lake this winter, about two weeks ago,
25 and discovered that there is less than a foot of free
26 water under the ice at the crossing site, so it doesn't
27 appear that this is likely to be used, that the precise
28 alignment is likely to be used by fish as a spawning
29 or overwintering area for the simple reason that there
30 are now six feet. The total depth of the thing at the

Webb, Dabbs, Gunn, McCart
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1 crossing site is only seven feet and in an extremely
2 cold snow-free winter the thing would probably be frozen
3 to the bottom. If there are spawning or overwintering
4 sites in that lake they are probably somewhere else
5 and not at the alignment; and we would be going back
6 there to check this out at some future time.

7 Q How big is this lake,
8 Dr. McCart?

9 A It's this lake here,
10 what is this, one mile? Approximately five miles long
11 and a tenth of a mile or so across.

12 Q And did Mr. Williams
13 indicate that a shift in the alignment would be possible
14 if in fact you found that there was interference with
15 potentially critical areas such as spawning beds and overwintering
16 areas?

17 A Within this area here
18 there is some flexibility moving from the outside of
19 this lake, the second lake on this side here.

20 Q Mr. Webb, I understand
21 that you've been studying whales in the Shallow Bay
22 area for -- since 1972, is that right?

23 WITNESS WEBB: F.F. Slaney
& Company has, yes.

24 Q Have you personally not
25 been involved in the study for that long?

26 A Not personally involved
27 in field work each of those four years, no.

28 Q All right. Before F.F.
29 Slaney got into it, is Dr. Sergeant the only other
30 person who has been conducting scientific studies, or

Webb, Dabbs, Gunn, Mc Cart
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Cross-Exam by Hollingworth

1 have there been others?

2 A No others to my knowledge
3 in the Mackenzie estuary.

4 Q What about on the area
5 around Kendall Island? Is that included in your answer?

6 A Yes, although we might
7 define what "scientific studies" are. I know of --

8 Q I'm referring to something
9 more than personal observations.

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1 A Dick Hill of Inuvik
2 attempted to tag a number of whales in the estuary
3 somewhere. I'm just not sure where. I don't know
4 of a scientific publication of that work, so I'm not
5 sure whether it actually follows into the definition
6 of the kind of thing we're talking about or not. I know
7 of no others.

8 Q Right. Now, I understood
9 you this morning to say that your studies could not
10 be conducted -- your overflights could not be conducted
11 daily because of weather conditions among other things;
12 demands on the pilot's time and such.

13 A Yes, fog's a problem and
14 overcast conditions, yes.

15 Q Were studies ever
16 conducted daily for a protracted period by overflights?

17 A I would have to check
18 on that. I believe that for some short periods, there
19 were daily flights, yes.

20 Q What would a short period
21 be?

22 A I couldn't tell you off-
23 hand but I could check if you wish.

24 Q How late in the calendar
25 year did your studies ever go?

26 A I think a general cutoff
27 date was around August 15th. Perhaps in 1975, flights
28 were made later than that, but again, I would have to
29 check.

30 Q Would they have gone to

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Hollingworth

1 September 1st, for instance?

2 A They may have in '75.

3 Q Do you have any data
4 that goes back beyond 1965 for instance in this area,
5 either Slaney or somebody else?

6 A Yes, now that we discuss
7 it, Dr. Ian McEwen of the Canadian Wildlife Service
8 made observations on white whales in the 1950's as
9 I believe part of a broader study that he was making
10 of conditions in the Kendall Island area.

11 Q Has that been published?

12 A It's in manuscript form
13 with the Canadian Wildlife Service in Edmonton. I'm
14 not sure about its publication.

15 Q Are there any other data
16 that you know of?

17 A There are other publica-
18 tions on white whales in the Beaufort Sea area. One
19 I can think of is Manning and MacPherson, a broad
20 faunal study of Banks Island and they mention white
21 whales as part of the fauna. If my memory serves me
22 correctly, the letters that -- publication that I
23 referred to this morning with reference to white whales
24 in estuaries on the north and west side of Banks Island,
25 although I haven't had an opportunity to check that out.
26 Another publication is a book by Stefansson, the noted
27 explorer recounting his observations of white whales
28 west of Banks Island. I believe -- well, I'm not sure
29 of the date he made his observations. The date of
30 publication was, I think, 1914.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Hollingworth

1 Q All right. You gave
2 your opinion this morning that you felt the population
3 of beluga whales at the present time was either stable
4 or increasing.

5 A I was paraphrasing a
6 general conclusion of that nature made by Dr. Sergeant.

7 Q Oh, I'm sorry. I guess
8 you agreed with it though, did you?

9 A Yes.

10 Q That interested me because
11 looking over your figure one in your study, the Slaney
12 study, there appear to be very few young whales in that
13 figure and I'm given to understand that that's an
14 indication that might have a declining population.

15 A Well, what figure are
16 you referring to?

17 Q It's figure one, I
18 understand of the most recent Slaney study.

19 A Which, if it's the 1975
20 draft, I don't have a copy of.

21 Q I don't either.

22 A Well, without taking up
23 much time, I would guess that none of our population
24 data show young of the year to any significant degree.
25 They're very, very difficult to see in the murky waters
26 of the Mackenzie Delta estuary. They're small and they're
27 grey and they're at their mother's fin so to speak and
28 very, very difficult to observe.

29 Q Then your studies are
30 incomplete in that regard?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1
2 A We have no data on calving
3 success, that's true.

4 Q Have you -- can you go
5 back beyond 1972 to really get any feel as to whether
6 the population is increasing or decreasing?

7 A Dr. Sergeant, I believe
8 in making his statement referred to observations from
9 about 1960 on. Observations that he either made or was
10 aware of.

11 Q Well, compared to say
12 ten years ago, is the population higher or lower, or
13 would you not know?

14 A I would have to say,
15 and here again, I'm trying to remember Dr. Sergeant's
16 precise words, but if I remember correctly, the popula-
17 tion would be not less than it was ten years ago and
18 could be more.

19 Q Now, referring to the
20 same chart again and I say I believe it's figure one
21 in the Slaney study of '75, the chart shows the sex
22 of the whales. Do you recall that?

23 A No, I don't recall. I
24 accept your word.

25 Q All right. I'm just
26 wondering how you sexed a live whale.

27 A I think we'd better see
28 the chart. Are you sure that wasn't --

29 Q I'd better
30 withdraw that question, it's not all that important to

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

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me, and I don't have the document to supply to you. I
expected that you would have it.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A Well, a standard flippant
2 answer is to ask the whales themselves, but in this case
3 I don't think that's -- you may be speaking of harvested
4 whales.

5 Q That's the only way I
6 could tell, if they're out of water.

7 A However, the adult males
8 are larger and whiter, and do stand out.

9 Q Miss Allison has come to
10 my rescue, and shown me figure 1, from the '75 White
11 Whale Study.

12 A Yes, this is from a sample
13 of whales taken in the native fishery, and they were
14 actually examined by the biologists.

15 Q Well, wouldn't the survey
16 made of the hunt be inaccurate as to the population as
17 a whole, because the people fishing for whales would
18 tend to go after the larger ones, wouldn't they?

19 A Yes, that's certainly the
20 case.

21 Q So there are more likely
22 to be a predominance of males, which in fact is shown
23 in figure 1.

24 A Yes, and I'm sure that's
25 discussed in the discussion of the report. And I would
26 be very surprised if there was an extrapolation, or an
27 inference, that in fact that sex ratio applied to the
28 population as a whole. I'm sure it wouldn't.

29 I think it's interesting to note
30 though that there are adult males in the estuary at the

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 time. It indicates that there's a reason for being in
2 the estuary other than to produce calves.

3 Q Now, in proceedings before
4 the Federal Power Commission in Washington in Volume 99,
5 on page 1,500 -- sorry -- 15,317, Mr. Dau, testifying
6 for Arctic Gas, was asked when construction would start
7 in Shallow Bay, and said that it would be April, because
8 new information suggested that whales weren't bothered
9 by construction. Now, is any information Mr. Dau
10 going to have, have come from you? Do you know of any
11 other people advising Mr. Dau with respect to beluga
12 whales?

13 A There could be any number,
14 but I'm not aware of them.

15 Q All right, perhaps Mr.
16 Rowe could find out the answer of that question and
17 advise me? So that if in fact it is only you, the new
18 information is the information based on your 1975
19 studies, that is contained in your 1975 study?

20 A I believe Arctic Gas has
21 access to all four reports, not just the 1975 report.

22 Q Well, yes sir, but he
23 referred to new information. This was in April -- no,
24 it was a little earlier than that, in 1976, that Mr.
25 Dau was testifying.

26 A I'm afraid I can't shed
27 any light on that, I haven't spoken to Mr. Dau
28 directly about whales.

29 Q Now, perhaps if you could
30 look at page 2 of your testimony, your prepared

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 testimony. As I understand it, you're recommending
2 against activity in Shallow Bay in July, during the
3 calving season.

4 A I'm saying two things
5 essentially. I'm saying that if it were to occur in
6 July, the biological consequences wouldn't be serious,
7 but nevertheless and not withstanding that opinion, if
8 possible, don't construct in July.

9 Q And you're giving that
10 opinion I would suggest because you're not sure, not
11 100% sure in any event, whether the consequences would
12 be serious or not.

13 A It's an opinion, and I'm
14 never 100% sure.

15 Q Well, you're not even as
16 sure as you'd like to be.

17 A I think I would -- what I'm
18 being is conservative. There is a possibility that
19 whales benefit from being in Shallow Bay, and if at
20 all possible, taking everything into consideration, my
21 feeling is that they should be given the opportunity
22 to enter Shallow Bay. However, if they are denied that
23 opportunity, that the biological consequences of that
24 denial would probably not be serious.

25 Q But the biological -- the
26 consequence of construction in July might be that they
27 might not enter Shallow Bay.

28 A They might enter to the
29 mouth of Shallow Bay, and penetrate for a couple of
30 miles, which would take them within two miles of the

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 crossing site, and it's my opinion that they may not
2 go any further than that during the actual construction.

3 Q So that, on page 2 of
4 your testimony, when you say in the second to last
5 paragraph,

6 "Should they fail to become fully accustomed to
7 buried pipeline sounds, biological consequences
8 would be similar to those expected during
9 construction in July."

10 do you mean that during the entire operation of the
11 pipeline, the whales may not enter Shallow Bay beyond
12 the crossing site?

13 A Yes, that paragraph is
14 in reference to the possible effect of pipeline noises
15 and reaction of whales to pipeline noises. I could
16 amplify on that if you wish.

17 Q Surely.

18 A I'm given to understand
19 from talking to Mr. Hollingshead, that on the average,
20 the pipe would be covered by ten feet of materials,
21 either gravel or silt, depending on the actual
22 mechanism for filling in the trench. I have discussed
23 this with Dr. Dean Fisher, and we share the opinion
24 that it is most unlikely that the whales would be
25 deterred in any way, by noises emanating from a pipe
26 buried to that depth.

27 Q Do you have any idea what
28 the noise would be from a pipe buried that deep?
29
30

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A We have an idea of what
2 the noise would be from a pipe buried at shallower
3 depths, about four feet. The noises are discernible
4 immediately over the pipe but quickly attenuates and
5 are not discernible from regular normal water noises
6 very far away from the trench itself.

7 Q All right now, this
8 morning in cross-examination by Mr. Bayly, Dr. Sergeant's
9 observations at Churchill were discussed, and in that
10 same volume that he quoted to you, Volume 121, on page
11 18,481 Dr. Sergeant makes the comment at line 18:

12 "At Cunningham Inlet and Lancaster Sound, where
13 we have been able to approach these animals
14 very closely on the shore without disturbing
15 them at all, you have only to skip a pebble at
16 the top of a group of animals upstream and
17 they will panic."

18 What's your comment on that? Would you agree or disagree?

19 A I would have no reason to
20 disagree.

21 Q Have you made any obser-
22 vations in the Shallow Bay and Mackenzie Bay areas to
23 uphold that sort of view?

24 A We haven't skipped any
25 pebbles in their direction, if that's what you mean,
26 but we certainly have observed whales in the calving
27 or what is assumed to be the calving area in what is
28 assumed to be the period that they're calving, and we
29 have observed their response to a number of industrial
30 activities associated with final construction.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 This is, in fact,^{is} the substance
2 of our four reports.

3 Q All right now, as I
4 understand it, you would not be sure of the consequences
5 in the event that there was considerable boat traffic
6 in the Mackenzie Bay during the calving season?

7 A I think I stated that I
8 would be concerned about the consequences of heavy
9 boat traffic, yes.

10 Q What would heavy boat
11 traffic be or are we back to the same argument?

12 A We're back to the same
13 thing. What's heavy? What's minimum? I don't really
14 know, and when I started to go over our reports to
15 see if I could pull that together and I couldn't over
16 the noon hour. I'll try this evening and see if I
17 can.

18 Q Well, maybe if I could
19 leave some figures with you; you might comment on those
20 at the same time. We've discussed the 340,000 cubic
21 yards of fill that might be used as backfill from
22 Shallow Bay, and it's discussed as a possibility by
23 the panel that preceded you, that gravel might come
24 from Shingle Beach area -- or Shingle Point; and my
25 advisors tell me that with a standard 1,500-ton barge
26 you could only accommodate 900 cubic yards on each
27 barge and I've worked it out, and of course you're
28 free to do this yourself, I've worked it out that there
29 would be 377 one-way trips, that is 377 barges on a
30 one-way trip, and twice that if you count the necessary

Webb, Dabbs Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 return trips. You might take that into consideration
2 and let me have your views on that at the same time
3 as you're looking at those other figures.

4 A I can comment on that
5 right now, if you wish. That would sound like heavy
6 traffic to me, and it is in the area of what I've
7 expressed general concern about, and ^{most} certainly I would
8 and have, in fact, suggested that that course of action
9 should be avoided, if possible.

10 During the period that whales
11 are expected to be in the critical West Mackenzie
12 Bay region.

13 Q Now this morning you and
14 Mr. Bayly discussed recommendations that you had made
15 to Arctic Gas and you discussed No. 5, which was that
16 aircraft and boat landings at whaling camps be kept
17 to a minimum; but apart from rubber-necking, the
18 people working on construction at the Shallow Bay cross-
19 ing would have no reason at all to go to the whaling
20 camps, would they?

21 A No, that's right. None
22 that I know of or am aware of.

23 Q Now, looking at the
24 other one, sir, recommendation No. 1 is that construction
25 activity take place after the majority of the whales
26 are observed to have left the area, and I think that
27 you'll agree with me, sir, that Mr. Williams' view is
28 that that would be impossible.

29 A I'm not sure that I
30 could agree with that or know why I should agree with

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 that.

2 MR. MARSHALL: I think that's
3 really not what he was saying. It would be impossible
4 to do that and not run into problems at the other end
5 with Dr. Gunn's geese.

6 MR. HOLLINGWORTH: Well, let
7 me state it this way then. At the present time, as I
8 understand it, Mr. Williams' view is that as soon as
9 breakup permits, activity will commence in Shallow Bay.
10 Is that your understanding?

11 A No, my understanding is
12 that there are perhaps conflicting recommendations
13 made, one with respect to whales, and with one
14 taking into account birds. Now I'm not sure that -- or
15 at least I'm not aware that a final designation has
16 been made. Perhaps I missed this in testimony last
17 week.

18 Q Well, perhaps you can
19 accept it from me, sir, that as I understand it Mr.
20 Williams plans to start his activities as soon as
21 spring breakup permits, around the middle of June or
22 maybe the end of June.

23 A I'll accept your word.

24 Q All right, and further,
25 sir, that the activity in crossing Shallow Bay would
26 take probably 48 days, perhaps a little less, and that's
27 going to conflict with the time that whales are in that
28 area, is it not?

29 A Yes, I would think there's
30 a reasonable chance of that happening.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 Q So with those givens, your
2 recommendation No. 1 is really impossible to meet, isn't
3 it?

4 A With those givens, the
5 recommendation would not be met.

6 Q All right. No. 2 recommen-
7 dation is that supervisory monitoring survey be undertaken
8 of both whale distribution and hunter harvest success.
9 Now in itself, that recommendation is going to do nothing
10 for the whales that are in that area during the construc-
11 tion season.

12 A The idea that I had in
13 mind when I made the recommendation No. 2 was that
14 monitoring surveys would determine two things:
15 (a) when most of the whales that were required by the
16 native hunters had been obtained, and
17 (b) when in fact the herd that normally frequents the
18 mouth of Shallow Bay or west Mackenzie Bay was leaving
19 or had left that general vicinity, and both those terminat-
20 ing dates or the terminating dates of both those
21 activities have varied in each of the four years, that
22 we have observed. My feeling was that if construction
23 was to take place in August, that it could start as soon
24 as the results of those monitoring surveys suggested
25 that it was - - that they were able to start without
26 conflict in those two areas.

27 Q Yes sir, but in itself
28 monitoring is not going to be of assistance if the
29 whales are in the area during the time construction is
30 taking place.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A Well, it certainly would
2 have been of assistance under those circumstances that
3 I described. Now with the givens that you have quoted
4 from Mr Williams, I would say that there are certainly
5 less need for those kind of surveys.

6 Q Well they might be very
7 useful surveys in themselves, but if construction takes
8 place at the time I'm suggesting to you Mr. Williams
9 said it's going to take place, the monitoring isn't
10 going to help the whales that are in that area.

11 A Yes, I think you're
12 right, a fair statement.

13 Q Now the third recommenda-
14 tion is that boat traffic, particularly those barges
15 hauling gravel from Shingle Point, should occur after
16 August 1st, but you will agree with me, I take it, that
17 Dr. Gunn would be concerned with that recommendation.

18 A Yes. None of my recommen-
19 dations has particularly taken notice of Dr. Gunns
20 concerns.

21 Q I appreciate that. They're
22 made in isolation, but nevertheless that's the case,
23 isn't it, that Dr. Gunn would be concerned with that
24 recommendation.

25 A I would suggest that Dr. Gunn
26 can answer that better than I.

27 Q All right, Dr. Gunn can
28 answer it right now.

29 WITNESS GUNN: The early part
30 of August would probably be quite all right, it depends

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 how long through August that goes.

2 Q Well, how late in August
3 would you be content that barge traffic kept up?

4 A The date of August 15th
5 is rather interesting because it's the date that's
6 been suggested that the whales might be clear of the
7 area, and it's also the date when the first geese
8 arrive, so that the window there is --

9 Q They can haul gravel on
10 the night of the 15th.

11 A But on the average the
12 geese don't get there until about August 25th to 28th.

13 Q All right, so that if
14 you take Mr. Webb's figure of August 1st, then there
15 is a three to four-week period there when you feel
16 comfortable at least, unless the snow geese arrived
17 early.

18 A Yes.

19 Q Now Mr. Webb, the fourth
20 recommendation is that aircraft overflights over west
21 Mackenzie Bay at low levels be avoided in late June
22 and the month of July, and of course we've gone into
23 this but theoretically you wouldn't want low level
24 flights at any time, would you?

25 WITNESS WEBB: I would have no
26 objection on behalf of the whales when the whales weren't
27 there. You could fly on the deck as far as they're concerned.

28 Q But at any time when
29 the whales were in the area you'd just as soon there
30 weren't any low level flights, wouldn't you?

~~Webb~~, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A I would say so, yes.

2 Q And the whales are in the
3 area for a substantial portion of the summer.

4 A Not in that part, no.

5 Well, substantial portion
6 could be as many as seven weeks, and we've recorded it
7 as few as two weeks, I believe.

8 Q All right, and we've already
9 discussed that there's no reason why Arctic Gas
10 personnel should go to the whaling camps in the first
11 place. So I suggest to you, sir, that really it's
12 recommendation No. 1 that has any bearing at all on
13 the well-being of the whale population.

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Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 A Subject to the considera-
2 tions that we've had in the last ten minutes, yes.
3 I think that's a fair statement.

4 Q And if, in fact, re-
5 commendation number one can't be met, then none of
6 your recommendations can be met by Arctic Gas.

7 A I don't follow you there.

8 Q Well all right, let me
9 rephrase that. If in fact, recommendation number one
10 can't be met, you're really not doing very much in
11 mitigation.

12 A I wouldn't agree with
13 that. I think that recommendation number four would
14 stand irrespective of the time of construction activity.
15 So would recommendation number three.

16 Q Subject to the snow
17 geese?

18 A Right.

19 Q All right sir.

20 A I would also point out
21 that my recommendations deal not only with the welfare
22 of the whale herd, but with the status and the
23 successful carrying on of the whale hunt.

24 Q All right sir. Dr. Gunn
25 yesterday when you were reading your testimony, you
26 deleted two paragraphs at the bottom of page two and
27 they were reinserted on page three with one exception.
28 The second paragraph had a sentence left out of it
29 which said:
30

"There are a number of other considerations which

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 on balance lead us to prefer the circum-delta route,
2 but they are not as overriding a concern as are
3 the fall goose concentrations."

4 Are those considerations still
5 outstanding that would, on balance, lead you to prefer
6 the circum-delta route?

7 WITNESS GUNN: Yes, they're
8 still outstanding. I dropped that sentence, because
9 I felt it was covered in other parts of the statement.

10 Q What are the other con-
11 siderations?

12 A The ones that we specify
13 relate to snow geese. The other ones relate to other
14 forms of geese, other waterfowl, the populations of
15 shore birds in the delta and so on.

16 Q Would they be too long
17 to enumerate?

18 A Not really, I think, that
19 that describes it. We have concerns for the -- in
20 general, for the waterfowl and shore birds that are
21 found at different seasons in the Mackenzie Delta. We
22 think they are of a considerable importance and a good
23 deal of the -- or virtually all the impact on them
24 would be avoided by going the other way. There are some
25 problems with going the other way, but on balance, we
26 feel that it would be preferable. That is the circum-
27 delta route would be preferable, so that our decision
28 is not based entirely on snow geese.

29 Q All right. What about
30 the fact, as I understand it, first of all, tell me if

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 I'm not correct, there are substantial numbers of birds
2 who moult on the west side of Shallow Bay during a
3 certain portion of the year, is that right?

4 A Yes, I think there are
5 numbers of birds in there that --

6 Q Which?

7 A They tend to seek out
8 fairly sheltered waters so that we find them in
9 the smaller channels and so on, rather than out on the
10 more open waters on Shallow Bay.

11 Q What sort of numbers?
12 Would you have any idea moults in that area?

13 A I don't have any precise
14 numbers on that. I could look it up for you.

15 Q Could you even give me
16 an estimate now?

17 A No, I don't think so.

18 Q Could you look it up and
19 let me know?

20 A Yes sir.

21 Q What time of year do
22 the birds moult?

23 A It starts in middle to
24 runs late July and through most of August.

25 Q Would the circum-delta
26 route avoid most of that area?

27 A Yes, it would.

28 Q Does the area extend over
29 to Shallow Bay itself?

30 A What area?

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1
2 Q The area that moulting
3 goes on.

4 A From the west side?
5 There are areas also on the east side where moulting
6 occurs.

7 Q Well I was going to get
8 to that next.

9 A It's not confined to the
10 west side. It --

11 Q I'm sorry, I'm having
12 difficulty hearing you sir.

13 A It's not confined to
14 the west side of the delta. There are areas throughout
15 the outer delta that are used by moulting waterfowl.

16 Q Well all right, but you
17 told me that they prefer quiet areas of water and I
18 would assume from that that they wouldn't favor Shallow
19 Bay as an area to moult.

20 A I think that is correct.
21 Certainly, the more open parts of Shallow Bay are not
22 frequented by large numbers of moulting ducks.

23 Q But would they choose
24 areas of water that come over almost to the west side
25 of Shallow Bay?

26 A Yes, I think we find them
27 in the channels and little inlets and ponds and lakes
28 bordering Shallow Bay on both sides.

29 Q That would extend also
30 to the east side, would it?

A Yes.

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 Q How far inland from the
2 east shore of Shallow Bay?

3 A Inland from the east
4 shore. Right across the delta. Right across to the
5 east channel.

6 Q On the route that Arctic
7 Gas proposes for its pipeline?

8 A All those lakes would
9 have moulting ducks on it, yes.

10 Q And around the areas
11 where Arctic Gas proposes to construct river crossings
12 in the summer?

13 A Some of those are in
14 pretty swift water and I don't --

15 Q I don't mean in the
16 channels themselves, sorry to interrupt. I mean
17 around those areas.

18 A Yes, around those areas,
19 you find moulting ducks.

20 Q What is a ducks' overall
21 reaction during moulting to disturbance, as opposed to
22 a time when it's not moulting?

23 A The principal factor is
24 that they can't get up and fly away from it. They have
25 stick it out pretty well where they are. Some birds
26 can manage to get away. They'll swim away if they
27 can. Others can and do stick out disturbance quite
28 satisfactorily.

29 Q Would it be fair to
30 say that they would be more alarmed by the same disturbance

Webb, Dadds, Gann,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 when they are moulting than when they're not moulting?

2 A I couldn't say that.

3 Q I asked Mr. Webb his
4 views on the business of gravel being used as backfill
5 in Shallow Bay. 340,000 cubic yards. If that gravel
6 was to come from Shingle Point, what are your views
7 on that?

8 A Looking at it simply from
9 an ornithological point of view, I would be particularly
10 interested in knowing precisely where at Shingle Point
11 that's coming from. There is a bar off Shingle Point.
12 If that's being used, it might have some effect on
13 birds. If it's being used, taken from a river channel,
14 there is less likelihood of it's having serious impact
15 on birds.

16 Q What about the impact
17 in the area between Shingle Point and Shallow Bay
18 crossing?

19 A Well, I share Mr. Webb's
20 concern for the whales in that area. I think that's a
21 major problem. As far as barge traffic up Shallow
22 Bay, across Mackenzie Bay and up Shallow Bay, in August,
23 I don't think that would have a major impact on birds.

24 Q All right. On the new
25 page three of your evidence, you recite in the last
26 paragraph that :

27 "The new site for the compressor station at Tununuk
28 Junction is a marked improvement over the old site."

29 A Yes.

30 Q That's obviously a

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 recommendation of yours that's been followed by Arctic
2 Gas in moving that; at least to a certain extent.

3
4 A So I believe.

5 Q On the old page three,
6 you stated:

7 "Other mitigative measures recommended included
8 sound attenuation, restrictions on movement of
9 personnel, barges and aircraft; and the considera-
10 tion of winter construction for major channel
11 crossings."

12 I take it that that's still
13 the case. You made those recommendations to Arctic
14 Gas, did you?

15 A Yes.

16 Q Now, have they accepted
17 any recommendations of yours with respect to sound
18 attenuation?

19 A I think that the chief
20 concern for sound attenuation is at the compressor
21 sites rather than on construction platforms and so on.

22 Q Go ahead sir.

23 A I believe that a fair
24 amount of investigation is being carried out by Arctic
25 Gas to see the extent to which attenuation can take
26 place at compressor sites. A certain amount of
27 attenuation can be done quite readily. After that,
28 it get more difficult and finally gets very expensive
29 to do so. That is still under investigation as far as
30 I know.

Webb, Dabbs, Gunn,
McCart, Jakimchuk, Rowe
Cross-Exam by Hollingworth

Q What level of sound
attenuation would satisfy you?

Webb, Dabbs, Gunn, McCart,
Jakinchuk, Rowe
Cross-Exam by Hollingworth

1 A We have placed a figure
2 on that, and I believe that it's in the vicinity of
3 50 Db at 1,000 feet; and I believe that in response
4 to that, Arctic Gas has said, well that's pretty
5 difficult, but they could probably attain around 60
6 Db at 1,000 feet.

7 Q Now, notwithstanding
8 the compressor station that's been moved to Tununuk
9 Junction, you indicate in your evidence that you would
10 still prefer that it be moved further, to Tununuk itself.

11 A Tununuk Junction is still
12 in the lowlands, in the eastern part of the delta.

13 Q And there's still going
14 to be impact on birds?

15 A And there will still be
16 some impact on birds there, yes.

17 Q Well what -- sorry.

18 A It's definitely a better
19 position than the prior one.

20 Q Well would your recommendation
21 of 50 decibels be the recommendation you would go with
22 at this new site at Tununuk Junction?

23 A I think the difference
24 in the sound level, probably is in the field of whether
25 birds, a mile and a half away, or two miles away,
26 might be influenced. Somewhere in that neighbourhood.
27 Some birds will be very little influenced, others will.
28 So that, at the worst year, clearing some birds out of
29 the circle say, two and a half miles in radius, or
30 about 25 square miles. Others would not be bothered at

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 at all, so that what the attenuation does, simply
2 is shorten that radius. The shorter it can be, attained
3 within the bounds of economic possibility, then the
4 better we like it.

5 Q Yes sir. What would the
6 decibel level be at 1,000 feet, when you're speaking
7 of this area that's two and a half miles in radius, or
8 diameter?

9 A That's radius. It would
10 be around 60 decibels to 70 decibels.

11 Q How much could you reduce
12 that if you reduced the decibel level to 50 at 1,000
13 feet?

14 A I don't think we have
15 precise figures on that.

16 Q No estimate?

17 A No. In our experience,
18 that would be a reasonable sound level. That's quite
19 a low sound level, 50 Db, and if it were that low at
20 1,000 feet, we consider that the impact would be
21 reasonably small.

22 Q Now, restrictions on
23 movement of personnel, barges and aircraft is a fairly
24 general recommendation. Have you ever listed those
25 recommendations more specifically in a document that's
26 available to the Inquiry?

27 A The only precise
28 recommendations we have made are in our list of
29 recommendations which we have forwarded to Canadian
30 Arctic Gas, and which are on file. We haven't made any

1 other specific ones beyond that, particularly in the
2 case of barges.

3 Q Do those recommendations
4 contain ones relating to restrictions of movement on
5 personnel and aircraft?

6 A Yes, they do.

7 Q And they're the ones you're
8 referring to in this old page 3.

9 A Yes.

10 Q And what would the
11 restrictions on barges be?

12 A The only restrictions
13 we have specified in terms of barges has been not in
14 the delta, but out on the staging sites on the North
15 Slope.

16 Q So on the delta itself
17 that recommendation is not made?

18 A No. I think that still has
19 to be looked at in terms of routing of barges, the
20 final siting of work operations. We can come down to
21 it much more closely in that event. At the moment, it's
22 a bit difficult to grapple with.

23 Q And I take it that the
24 last recommendation, the consideration of winter
25 construction for major channel crossings has been --
26 you've been advised as impossible?

27 A Yes, I understand that it
28 might involve danger to the lives of people involved,
29 as well as mere difficulty.

30 Q All right. Mr. Marshall,

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 should I direct questions for Mr. Hemstock to Mr.
2 Rowe, or should I wait for Mr. Hemstock to return?

3 MR. MARSHALL: I understand
4 that Mr. Hemstock is on his way back, and expects to
5 be here tomorrow, perhaps by noon, I don't know --

6 MR. HOLLINGWORTH: I'm quite
7 content to wait, I just wondered what you wanted.

8 MR. MARSHALL: I think it might
9 be best if leave them for Mr. Hemstock.

10 MR. HOLLINGWORTH: All right.
11 Mr. Jakimchuk, on the new alignment sheets, the route
12 passes quite close north and east of Travaillant Lake.
13 Are you familiar with that alignment?

14 WITNESS JAKIMCHUK: I've looked
15 at it, yes.

16 Q In fact it's within a
17 matter of a couple of hundred yards from the lake,
18 as I understand it.

19 A I'm not sure of the exact
20 distance.

21 Q Were you asked to make
22 recommendations on that, or to advise on its acceptability,
23 from a mammal point of view?

24 A Not specifically.

25 Q Have you considered it
26 from a mammal point of view?

27 A Yes we have, and we looked
28 at it in the course of surveys, looked at that
29 alignment, and have not come up with any specific
30 recommendation except to note that there is a greater

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 possibility of interaction with the bluenose caribou
2 herd on that side of the lake, than there would be
3 further to the west.

4 Q What about on muskrat?

5 A We have not deemed there
6 to be any significance of that -- to that alignment
7 on muskrat populations.

8 Q Mr. Rowe, perhaps you
9 could advise whether that alignment was considered
10 from a socio-economic point of view, its possible
11 interference with traplines.

12 WITNESS ROWE: With respect to
13 your question regarding traplines, there was some
14 discussion with the communities in that area as to the
15 location of their traplines, we had maps drawn with
16 the various traplines on it, and they were available
17 for use in determining these route alignments.

18 Q And you were advised that
19 there would be no conflict?

20 A No, no, I didn't say that.

21 Q What were you advised?

22 A We were advised where the
23 traplines were, with respect to the location of the
24 route.

25 Q Do you know if there's any
26 conflict with the traplines or not?

27 A The route in this location
28 does cross some traplines, which have been used by the
29 people of Fort McPherson and Arctic Red River.

30 Q Mr. Jakimchuk, Dr. McCart

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 and Dr. Gunn, this question is directed to you more
2 than the rest of the panel. Last week during cross-
3 examination of the technical panel, Mr. Gibbs doubted
4 the ability of Arctic Gas to cross the North Slope on
5 a construction scheme that proceeded in the winter.
6 Now, I think it goes without saying that all the
7 recommendations you have made to Arctic Gas, and your
8 qualified approval of that scheme, relates solely to
9 winter construction schemes, do they?

10 WITNESS JAKIMCHUK: That --
11 from the standpoint of that routing, that's the single
12 most important premise, with respect to our impact
13 assessment on mammals.

14 Q And Dr. Gunn?

15 WITNESS GUNN: I agree.

16 Q And Dr. McCart?

17 WITNESS MCCART: Yes, that's
18 the premise.

19 Q Have you given any
20 consideration to the consequences if a summer construction
21 program was proceeded with, and what ^{its} acceptability or
22 non-acceptability would be to you?

23 WITNESS JAKIMCHUK: Are you
24 asking me?

25 Q Well, we'll start with you.

26 A Yes, not on a formal basis,
27 but that is an automatic consideration that one makes
28 in making an impact assessment, on any given proposal;
29 and my own opinion on that is that the implications
30 are quite a bit different than a winter construction

Webb, Dabbs, Gunn, McCart,
~~Jakimchuk~~, Rowe
Cross-Exam by Hollingworth

1 program, and would be sufficiently different I feel to
2 perhaps cause me to alter the type of assessment
3 relating to impact on mammals of that routing.

4 Q Are you able to tell me
5 now whether you would find such a route acceptable or
6 not -acceptable in the summer?

7 A Well, I've responded in
8 a general way to your query. It all depends on what
9 you mean by summer, and whether you mean the existing
10 alignment, whether you mean a fullblown construction
11 proposal or whatever, I'm not quite sure. You stated
12 the proposition in a very general way.

13 Q I mean the existing
14 alignment from Prudhoe Bay to Tununuk Junction, with a
15 full blown construction scheme taking one year, proceeding
16 in the period from late April or early May, to the
17 end of September.

18 A I wouldn't find that
19 acceptable for some species, in other words I think the
20 impact on caribou calving, my opinion on that, impact
21 on caribou would be significantly altered if that were
22 to take place. For other species, I would not have
23 as much difficulty. Some of the minor species for
24 example, like microtine rodents, or for muskox for that
25 matter; would certainly ^{alter} the acceptability of that
26 routing with respect to caribou.

27 Q Would it make it unacceptable?
28
29
30

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
 Cross-Exam by Hollingworth

A In my opinion, yes.

WITNESS McCART: The data we have, of course, could be applied to an assessment of the impact of summer construction. I would suspect that I'd have some difficulty designing appropriate mitigative measures. I think the likelihood the population of fish would suffer would be greater if you had summer construction, particularly if it involved the construction of a permanent road. In other words, the type of construction comparable to what Alyeska is doing, with a permanent road alongside the pipeline right-of-way, is what I mean.

Q But does the permanence -- let me just get that straight. When you say "a permanent road" are you afraid of a road that would be used after construction, or is it just the actual feature of a physical road being there that concerns you?

A In both.

Q Well, let's isolate it, if there was never any use afterwards?

A If there was never any use afterwards?

Q Or only O. and M. personnel of the pipeline.

A I would still be concerned because of course if you're worried about gravel sources on the North Slope, if there's a road constructed, there will be a far, far greater need for gravel and it will have to come from somewhere. There is always the

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 temptation to take it out of flood plains. If the
2 gravel requirements are quite small it can be fairly
3 tightly controlled. The larger they get, the more
4 difficulty it is to remove gravel without the possibility
5 of some damage to aquatic habitats

6
7 Secondly, one of the major
8 problems that people have found with roads is the
9 problem of fish passage through culverts, and the fact
10 that roads are one of the major sources of sedimentation
11 in developing areas. So all of these would concern
12 me even if the road did not provide access, which it
13 is going to do. There's very little likelihood that
14 you're going to have a top quality all-weather road
15 across the North Slope which -- to which the public
16 is going to be denied access. I think politically this
17 might be a difficult problem.

18 Q Let's take that up with
19 the politicians. Dr. Gunn?

20 WITNESS GUNN: As Dr. McCart
21 has said, I think there are a good many very difficult
22 physical problems with summer construction. However,
23 apart from that, assuming that it can be done in
24 summer, I feel that a good many problems would arise
25 with regard to birds and that we would have to reassess
26 the whole picture. We have not done that.

27 MR. HOLLINGWORTH: Thank you,
28 gentlemen. Subject to Mr. Hemstock's presence, sir,
29 those are my questions.

30 THE COMMISSIONER: Just one
question, Dr. McCart. I'm just trying to remember our

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Hollingworth

1 discussion about gravel. You said the tendency to take
2 gravel from flood plains, I thought it was understood
3 that gravel would be taken from flood plains anyway,
4 that the idea was not to take gravel from the current
5 flood channel.

6 WITNESS MCCART: Yes.

7 THE COMMISSIONER: Well, is
8 your concern that if you build an all-weather gravel
9 road along the North Slope that the tendency might well
10 be to take gravel from the flood channel then?
11 You said the flood plain, but I thought we were taking
12 it from the flood plain anyway. We'd take a greater
13 amount, presumably, if we had to build a gravel road
14 from Alaska to the delta.

15 A Yes, and the more pits
16 you open in flood plains or whatever, the more difficult
17 it is to control, it seems to me. There's always the
18 greater the number you open, the greater the chances
19 that one of them will cause sedimentation in a sensitive
20 area or something -- a critical area.

21 THE COMMISSIONER: O.K., I
22 understand. How many pits were there to be along
23 there, was it 14? Miss Minning isn't here. Well, no
24 one else remembers, I guess.

25 MR. MARSHALL: I think that
26 might be in her evidence, Mr. Commissioner, I'm not sure.

27 THE COMMISSIONER: Well, don't
28 worry about it. I've got that figure and I know it was
29 98 altogether, but the number along there I --
30

MR. SCOTT: I have no questions

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Examby Scott

1 for Mr. Dabbs or Mr. Rowe, so I thought I should let
2 them know that.

3
4 CROSS-EXAMINATION BY MR. SCOTT:

5 Q First of all, let me
6 turn to Dr. McCart's evidence and see if I --

7 THE COMMISSIONER: Excuse me.

8 MR. SCOTT: I'm sorry, sir.

9 THE COMMISSIONER: Well,
10 let's have coffee if that's all right, Mr. Scott.

11 (PROCEEDINGS ADJOURNED AT 3:25 P.M.)
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30

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

(PROCEEDINGS RESUMED AT 3:45)

MR. SCOTT: Messrs. Gunn,
Webb, McCart and Jackimchuk; I would just like to read
some statements from Mr. McCart's testimony to see
if they achieve general agreement among the four of
you about the delta. Mr. McCart begins with this
sentence:

"The Mackenzie Delta is unique in the Arctic of
North America and its influence extends far beyond
the delta itself."

Further on:

"Any major change in environmental conditions
within the delta which have a detrimental affect
on populations --

and then he says of these species,

" -- could have geographically far reaching effects"
he goes on to say,

"on domestic catches"

Then thirdly on the next page he says, and he's speaking
of fish,

"It is my opinion that the Mackenzie Delta must
be accorded a high degree of protection."

Now, do I take it though that you haven't used the
same words each in your evidence that you adopt that
as a general statement of what is at stake when we
come to examine the delta. Any disagreement about that?
I take it that there isn't, and I take it that for at
least Dr.'s McCart, Dr. Gunn and Mr. Webb, the importance
of the delta is, if possible greater because it represents
a geographical area which is an important phase in the

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 life cycle of the species in which you're interested,
2 which species benefit and are important to other
3 geographical areas well beyond the delta. Everybody
4 agree with that?

5 All right. Well now, do you
6 all agree -- do the three of you agree that the
7 delta is as worthy because of its unique features, of
8 special attention and protection as, let us say, the
9 Yukon coastal plain. If we're looking to areas to
10 be concerned about and to protect, is the delta on
11 the same level, as far as you can judge as is the
12 Yukon coastal plain, or higher level?

13 WITNESS MCCART: Are you asking
14 each of us? I would say that possibly a higher level
15 because the Yukon coastal plain, at least a portion of
16 it, there are similar units on the American side of
17 the border.

18 Q Yes. Dr. Gunn?

19 WITNESS GUNN: I wouldn't like
20 to rank them one, two, but I would say they're both
21 very important.

22 Q Yes. Mr. Webb.

23 WITNESS WEBB: In terms of
24 whales, the delta.

25 Q Mr. Jakimchuk?

26 WITNESS JAKIMCHUK: I agree
27 they're both very, very important.

28 THE COMMISSIONER: In terms
29 of caribou though, the north coast is much more important.
30 There's no doubt about that.

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 A Yes, in terms of caribou,
3 correct. In terms of mammals, generally.

4 MR. SCOTT: Yes.

5 A That would be the case.

6 Q Perhaps you were here
7 or read Dr. Peterson's evidence in which he listed
8 a number of sensitive areas that should be excluded
9 from generally speaking, industrial development. Are
10 you all aware of that evidence? I'm sorry.

11 WITNESS WEBB: I'm not
12 specifically --

13 Q All right.

14 A Is this an ecological
15 reserve concept that he was speaking to?

16 Q No, he wasn't speaking of
17 the I.B.P. sites in that context. He defined a number
18 of areas that -- and you don't have to be troubled
19 with what they are at the moment in which he thought
20 there was sufficient sensitivity that they should be
21 excluded from general industrial or commercial develop-
22 ment. Now, I wonder if in that context, you would each
23 put the delta in such a category?

24 A If I may be the first,
25 I would not put it in such a general category. I feel
26 that certain industrial activity can take place without
27 serious impact on populations of whales, at least.

28 Q Yes. Obviously, it's
29 recognized that you each think that some industrial
30 or commercial activity can take place in the delta or
you wouldn't be here talking about a pipeline, but I'm

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

speaking about the general principle that with some exceptions, an area might be excluded from commercial or industrial development. Dr. Gunn, what do you have to say?

MR. MARSHALL: I don't understand the question.

MR. SCOTT: Well, I can't make it any clearer.

MR. MARSHALL: Well, you're relating it to what Dr. Peterson said and he had a specifically defined concept and you've now got a concept which may or may not have been his, with certain undefined exceptions to it, and I don't know what it means.

THE COMMISSIONER: Well, maybe we -- let me see if I understand this. In the pipeline guidelines, guideline four suggests that there may be geographical areas along the pipeline route excluded from pipeline construction or related activity. That seemed to be what Dr. Peterson and his -- and those who took the same position were talking about. The I.B.P. sites are something else again.

One of the areas that I think Dr. Peterson felt should be excluded totally from industrial activity was the delta. Now, that was before you came along with the cross-delta route but that's my recollection of his evidence.

Could you take it from there, I'm not quite with you?

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 MR. SCOTT: Take the concept
3 that the Judge has explained as an area excluded from
4 activity, I recognize that you gentlemen^{think} a gas pipeline
5 can nonetheless go through this area. What I am asking
6 you, is whether you think after a gas pipeline and its
7 attendant works are built, one should be inclined to
8 treat the delta as an excluded area to prevent further
9 industrial or commercial activity. Dr. Gunn, would you
10 like to begin?

11 WITNESS GUNN: I think I have
12 already stated my position in the opinion I wrote that's
13 part of our cross-delta report. In that, I think I
14 can summarize by saying that it's my feeling that for
15 the proper ecological survival of the delta as a viable
16 unit, industrial activity should be kept to a minimum.
17 There are already gas wells there. I don't see that
18 we are going to close them down.

19 But, I would like every
20 measure possible taken to minimize the industrial
21 activity.

22 Q Dr. McCart?

23 WITNESS MCCART: I think
24 I'd make the point that the delta is not really a -- it's
25 a huge area. It's not homogenous and certainly within
26 the delta, there are areas that I think could possibly
27 be closed to further development because they're
28 critical to some population, possibly birds, possibly
29 fish, things of this sort. Certainly any development
30 within the delta has got to be highly regulated, it seems to

Webb, Gunn, Dabbs, McCart,
Jackimchuk, Rowe,
Cross-Exam by Scott

1 me, because it is an area in which probably there is
2 going to be further exploration work, further finds
3 of this, that and the other thing and it's quite easy
4 to get a repetition of -- I'm not looking for the
5 word "repetition", but it's quite easy to get --
6

7 THE COMMISSIONER: A succession.

8 A -- succession of activities
9 that are unnecessary and it seems to me that this has
10 to be regulated. I think the delta should be treated
11 as a unique area and I think it should be highly
12 regulated and I'm kind of of the opinion that there
13 possibly should be a regulatory board or something of
14 this sort whose main concern is the delta.

15 MR. SCOTT: I take it that
16 you've mentioned also the possibility that certain
17 areas should, in terms of development, be frozen because
18 of their particular biological importance?

19 A Yes, I think so.

20 Q Mr. Jackimchuk?

21 WITNESS JACKIMCHUK: I think
22 I agree with what Dr. McCart has just said, but I
23 would like you to restate your question, please Mr.
24 Scott because I've forgotten precisely what you asked.

25 Q Well, as the Commissioner
26 has said, the guidelines contemplate that there may
27 areas that should be excluded from gas pipeline develop-
28 ment along the route and by implication from other
29 kinds of industrial or commercial development. Your
30 view obviously is that a gas pipeline is tolerable
across the delta, or you wouldn't be on this panel, I

Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 presume. Do I understand that what is your view about
3 further development beyond that?

4 A Well, I haven't studied
5 that particular proposition. However, as Dr. McCart
6 mentioned, the delta area is something in the order of
7 5,000 square miles. My main concern as I alluded to
8 yesterday regarding deltas, would be those activities
9 or those acts which could create a fundamental change
10 in the dynamics of the system and whether that funda-
11 mental change occurred as a result of one act or ten
12 years of development is inconsequential. I'm concerned
13 about the fundamental change that happens to deltas.

14 I would be very concerned
15 about that type of possibility at some time perhaps
16 happening with the Mackenzie Delta, particularly in
17 view of hydro-electric developments. I think there
18 can be some industrial activity that is compatible
19 with the maintenance of the delta; its productivity,
20 its populations. I think this is definitely possible
21 under regulation, as Dr. McCart has said. That doesn't
22 automatically mean an exclusion of all activity.

23 I think there^{are} some compatibili-
24 ties.
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q Well now, Dr. Gunn, Dr.
2 McCart and Mr. Jakimchuk, I take it that while you
3 all have extensive experience in the north and have
4 had access to all literature and your own studies and
5 others, it was not until the autumn of 1974 that a
6 route was put before you, that crossed the delta, for
7 your opinion.

8 WITNESS JAKIMCHUK: That's
9 correct.

10 Q Dr. Gunn?

11 WITNESS GUNN: Right.

12 Q Yes, so that we may say
13 that apart from your study of the literature and apart
14 from your general knowledge, your reaction to a specific
15 route on a specific basis, a site by site basis, has
16 occurred only in the last year.

17 WITNESS MCCART: Year and a
18 half.

19 Q Year and a half. Well now,
20 Mr. Webb, you are with the Slaney Company, I understand.

21 WITNESS WEBB: I'm representing
22 them in this instance, yes.

23 Q Well, when were you con-
24 sulted by Arctic Gas about this specific route?

25 A Immediately after or
26 during the producer segment of the Inquiry in February
27 in Inuvik.

28 Q And I take it that it
29 would be following that, that you were obliged, as a
30 consultant to Arctic Gas, to examine the cross-delta

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 route in precise detail and form an opinion with respect
2 to it.

3 A With respect to the
4 crossing of Shallow Bay only, and then with respect to
5 any potential impact on white whales.

6 Q Yes.

7 MR. MARSHALL: That was in
8 January.

9 MR. SCOTT: I see, and do you
10 know who was advising Arctic Gas with respect to the
11 whale problem before you were hired?

12 A I believe it was Mr.
13 Jakimchuk who could speak to that.

14 Q I see. Is that so, Mr.
15 Jakimchuk?

16 WITNESS JAKIMCHUK: Not entirely.

17 Q Well, was anybody else
18 advising them with respect to whales?

19 A The potential impacts on
20 white whales were recognized virtually as soon as the
21 routing was proposed, at which time I believe I was
22 asked for an opinion regarding that. I suggested that
23 we conduct some studies on the white whales. The sequen-
24 ce of events that occurred following that was that
25 Arctic Gas, however, were interested in obtaining the
26 existing studies conducted by Slaney, procured these,
27 as I understand, by payment of monies to the sponsoring
28 companies, in order that they wouldn't duplicate
29 the same work that had been done previously, and it made
30 a lot of sense. So my involvement became fairly

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 peripheral. They obtained these studies and utilized
2 them internally up until the time when Mr. Webb became
3 actively involved.

4 Q Well, just so I'll be
5 clear, you gave no advice on the likely impact on
6 whales in any particular sense to Arctic Gas.

7 A No, no, I didn't.

8 Q So it would be correct
9 to say that until Mr. Webb came on board, Arctic Gas,
10 as far as we now know, only had access to the Slaney
11 studies.

12 A As far as I know, that's
13 correct, and we discussed it in meetings periodically.
14 We discussed the reports, the Slaney studies in a
15 general way.

16 Q And I take it, Mr. Jakim-
17 chuk, it was recognized at the beginning when the
18 cross-delta was first discussed, that this was likely
19 to be a problem that required some critical examination.
20 Whales became an issue when the cross-delta was mooted.

21 A Yes, they became an
22 issue.

23 Q Now, Dr. Gunn and Mr.
24 Webb, I take it from your evidence that what you were
25 asked to do was to determine whether the cross-delta
26 route was environmentally acceptable. Have I got that
27 right? On the terms on which Arctic Gas proposed to
28 construct it.

29 WITNESS WEBB: I think you
30 are paraphrasing Mr. Commissioner's request to have me

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 look at the cross-delta route because I do believe in
2 all fairness, that's where my involvement started.

3 Q Well, I think it's good
4 that Arctic Gas got an expert in this area, and I don't
5 care how they got it, at the moment. But that's what
6 you saw you were expected to do.

7 A Yes, essentially.

8 Q Dr. Gunn?

9 WITNESS GUNN:

A Well, I don't think that
10 quite fits my idea of the situation. We were asked
11 to examine the cross-delta route first of all from the
12 point of view of literature survey and what we knew
13 about it already, and then to design field studies
14 over a summer period to increase our knowledge, fill up
15 holes about things we didn't know. Then to write a
16 report on the cross-delta route and to compare it with
17 the circum-delta route.

18 Q Yes, well let's come
19 right out then, Dr. Gunn. Is it your judgment, with the
20 conditions that you have set out, that the cross-delta
21 route is environmentally acceptable?

22 A I think it's environmen-
23 tally acceptable with the conditions as they are now.

24 Q And Mr. Webb, that's the
25 thrust of your evidence now for your field, isn't it?

26 WITNESS WEBB: I think that's
27 the thrust. I might go further and define what I con-
28 sider to be environmentally acceptable. I think of
29 it in terms of significant effect on the welfare of
30 the population of in this case, white whales.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q I made this point before
2 but I think I regard it as so important that I propose
3 to make it again. This -- your evidence, it seems to
4 me, is a representation to the public that this project
5 crossing the delta is environmentally acceptable if it
6 is built as Arctic Gas says it will be built, and if
7 it is built with the conditions that you have stipulated
8 as recommendations. Do you both understand that?

9 A I would agree.

10 WITNESS GUNN: Yes.

11 Q Now, if one of those
12 recommendations or conditions turns out to be one that
13 Arctic Gas is unwilling or unable to apply, I take it
14 that all bets are off, and your statement as to
15 acceptability has to be reviewed.

16 WITNESS WEBB: I think that
17 depends on the nature of the recommendation that could
18 not be implemented.

19 Q Well, let's take the
20 recommendations that you have made, Mr. Webb. I take
21 it that if the first one is either, will not be
22 accepted by Arctic Gas or cannot be accepted, you would
23 then not want to make a public statement that the cross-
24 delta route is environmentally acceptable.

25 MR. MARSHALL: Mr. Scott, I
26 hesitate to interrupt, but you will see on the third
27 page of his evidence he has a paragraph where he sets
28 out the biological consequences, and then he goes
29 beyond that, having assessed what the impact, he goes
30 beyond that to make further recommendations. So you

Webb, Dabbs, Gunn, McC art
Jakimchuk, Rowe
Cross-Exam by Scott

1 have a 2-phase situation, if you like.

2 MR. SCOTT: Well, Mr. Webb
3 can speak for himself, that's the virtue of having
4 him here.

5 THE COMMISSIONER: Well,
6 I think Mr.Scott is right. But Mr. Webb made it clear
7 to me his position on the consequences of the whales
8 not being allowed access to Shallow Bay. He went on
9 to explain the implications of these recommendations
10 and I think the question is a fair one. That is if
11 condition No. 1 isn't met, that's the principal condi-
12 tion really, are you willing to say publicly that this
13 pipeline ought to be built across Shallow Bay along the
14 route that Arctic Gas has proposed, from an environmen-
15 tal point of view?

16 A Yes, I'm willing to say
17 that it can be built without -- can, not ought.

18 MR. SCOTT: Well, let's take
19 ought, because that's what the biologists and lawyers
20 are here talking about, whether it ought to be built.

21 A Well, I'm afraid I'm
22 not in a position to use that word because -- or I don't
23 feel I am at any rate, because I've not really had
24 the opportunity to compare routings.

25 Q Well, Mr. Webb, I'm sorry
26 I'm not asking you --

27 THE COMMISSIONER: To compare
28 what?

29 MR. SCOTT: -- at the moment
30 to compare routings.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 THE COMMISSIONER: Oh, routings.

2 MR. SCOTT: We will come to that
3 in a minute. On the wall behind you there's a red line
4 which for the moment is the routing, and what I'm saying
5 to you is that your evidence and Dr. Gunn's is a repre-
6 sentation to the public that the construction of a line
7 across that route as Arctic Gas has said it will be
8 constructed -- that is according to the construction
9 plan of which they've given you information -- is
10 acceptable in terms of your discipline: if these condi-
11 tions are met. What I'm saying is, that if one of those
12 conditions cannot be met, or Arctic Gas is not willing
13 to meet it, are you still prepared to represent to the
14 public that it is environmentally acceptable, or do you
15 want to have a second look at it?

16 A No, I'm prepared to re-
17 state that if recommendation No. 1 is not met, that in
18 my view the impact on whales would be environmentally
19 acceptable, still.

20 Q Is there any condition that
21 you have stipulated which could not be breached and
22 which would still allow you to make that statement of
23 acceptability?

24 A I am most concerned about
25 recommendation No. 3 with reference to boat traffic,
26 hauling gravel from Shingle Point during the period of
27 July.

28 Q So can we put it this way,
29 there are conditions among your conditions which, if
30 unwilling to be enforced or unable to be enforced would

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 lead you to have reservations about the acceptability
2 of the projected route?
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A That condition in
2 particular would -- if not followed, would require my
3 re-evaluation, yes.

4 Q And I take it that if it
5 cannot be followed or will not be followed, you're
6 not representing that this route is acceptable.

7 A That's right. I would
8 like to say one more thing, in case that is the end
9 of the conversation as far as you're concerned. I'm
10 not here as a proponent of the project, and I still
11 don't wish to use the word "ought", which suggests
12 that I am proposing this route.

13 Q What's your reservation
14 about this route?

15 A I've no specific
16 reservation about the route that I haven't mentioned,
17 I don't believe. It's just that I don't feel I am
18 a proponent of this route, I am in fact giving an
19 opinion as to what the effect might be, should it
20 be constructed as I understand it to be constructed.

21 Q Well if it can be built
22 in the way you've said, is there any reason that occurs
23 to you, in biological terms, why it shouldn't be built?

24 A Could you repeat that one
25 for me, please?

26 Q Yes. You say it can be
27 built, with an acceptable environmental risk, on
28 Condition 3. Is there any reason why it shouldn't be
29 built?

30 A Not with respect to white

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 whales, that I know of.

2 Q All right. So that -- that
3 not to make too fine a point on it, as far as you're
4 concerned, the public can relax if those conditions
5 are met.

6 A I would think that it
7 would be wise not to relax. Vigilance is always in
8 order, I would suspect, and I do concur with, I think,
9 Dr. McCart's statement, and Mr. Jakimchuk, that regulation
10 is in order, and implementation of those regulations
11 is very important.

12 Q The reason I'm concerned
13 about it, and I've emphasized it with other panels,
14 is that if, God forbid, something goes wrong, and
15 unfortunate consequences occur, while the construction
16 plan stipulated is being carried forward, environmentalist
17 or biologists who have said the project is acceptable,
18 are going to be on the hook; and I want to be sure
19 that you're squarely there, so that the public will
20 know. Now Dr. Gunn, if the conditions that you have
21 stipulated are unable to be complied with, or if the
22 company is unwilling to comply with them, do you want
23 to have a second look at your statement of acceptability.

24 WITNESS GUNN: I should say
25 first of all that despite what I said to Mr.
26 Hollingworth before the break, we did have some
27 specific recommendations pertaining to the cross-delta
28 route, and they are contained in our report at the
29 end of the comparative study. Now, we have stated that
30 we prefer the circum-delta route, because there's less

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 likelihood of stress on birds, but we have looked at
2 the cross-delta route, and there are some recommendations
3 we have made, that feel very strongly about; others
4 not quite as strongly about. The two critical ones
5 in our view are the removal of the compressor site
6 from the early location, and that has been done. The
7 other one concerns the crossing of Shallow Bay, and
8 in our view it's important that work on that should
9 stop once the snow geese are pushed back off the North
10 Slope into the delta. We feel that's of prime
11 importance.

12 Q But you understand, do you
13 that while you've been asked to compare, your comparison
14 is being read as a statement, that while not preferred,
15 the cross-delta is an acceptable route on certain
16 conditions?

17 A Yes, I understand that.
18 It's a calculated risk that we are taking in making
19 that, but I feel it's justified.

20 Q Now, do I understand you
21 to say that if that condition that you referred to
22 about Shallow Bay could not be met, or was unable to
23 be met, that you would want to reconsider your
24 statement of acceptability.

25 A Correct.

26 Q Are there any other
27 conditions that you have stipulated which would lead,
28 if breached, to -- or if they could not be complied
29 with, to a review of your statement of acceptability?

30 A Yes, I think that

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 recommendations regarding air traffic regulations are
2 very important. However we've also made a recommendation
3 about winter construction, and I believe now that this
4 is not a practical thing, so that if that were not
5 carried out, I won't feel that that is a breach of
6 our situation.

7 Q Any others that would
8 lead to a review of your statement of acceptability?

9 A We have made recommendations
10 about retaining human activity during the summer to
11 the facility sites. I think that's an important one.
12 We have recommendations about barge movements and so on,
13 but at the present time those are just general and
14 they need to be worked out in detail.

15 Q Any others that occur to
16 you now?

17 A None that occur to me now.

18 Q Well now, Mr. Webb, let's
19 come to your paper, if I may. First of all, is it a
20 fair statement of your evidence, that for a variety
21 of reasons, including the turbidity of the water, and
22 the shortness of documented observations, and others,
23 that it is difficult to make affirmative statements
24 about the conduct of the white whale?

25 WITNESS WEBB: That's a fair
26 statement.

27 Q And would it be fair to
28 say that for those very reasons, the conclusions that
29 one draws are likely to be speculative, though not
30 inconsistent perhaps with what's been observed.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A I think it's difficult,
2 but not impossible. If I felt it was impossible I
3 wouldn't have ventured the opinion, Mr. Scott, that,
4 well certainly there is a possibility that things
5 are not what they seem, and I have endeavored in both
6 my testimony and my discussion, to point out whatever
7 weaknesses seem apparent to me.

8 Q Yes, my concern here is
9 that the eagerness of none of us should force you, or
10 should be seen to force you to state more affirmatively
11 as a proposition, something about which there are
12 limits on our knowledge; and would it be fair to say
13 therefore, that it is perhaps too early to approach
14 as a matter of firm probability, any decisions about
15 how the white whale lives, or why it goes where it
16 does, or matters of that type?

17 A No, I think that -- "firm
18 probability" is the term you used?

19 Q Yes.

20 A No, I stand behind the
21 opinion that I've made in this direct testimony, as
22 the -- stating what will be the probable reaction of
23 white whales to the activity as I understand it.

24 Q Well, isn't it true, that
25 any disturbance of whales, in June or July that are
26 in SHallow Bay, may reasonably be anticipated to include
27 disturbance of calving or new-born calves?

28 A Could you repeat that one
29 for me again, so I am sure I understand?

30 Q Isn't it fair to say, that

Webb, Dabbs, Gunn, McCArt,
Jakimchuk, Rowe
Cross-Exam by Scott

1 if whales are in Shallow Bay in June and July, any
2 disturbance to them may invoke disturbance of calving
3 or new-born calves?

4 A Yes. But my point is that
5 if they are denied access to Shallow Bay, that there
6 is other suitable calving and calf rearing habitat
7 available to them.

8 Q Yes. And what you're
9 really telling us, is that elsewhere ^{where} there is water,
10 not too far away, not too far away, that is above ten
11 degrees centigrade or Celsius.

12 A Water that they have
13 apparently used with success.

14 Q Well, what I'm asking
15 you is, what leads you to conclude that if whales
16 are disturbed in Shallow Bay during a construction
17 summer, that they will successfully calve somewhere
18 else?

19 A Because our observations
20 over four years have determined that apparently
21 calving has taken place in West Mackenzie Bay in at
22 least one of those years.

23 Q Well, isn't it this Mr.
24 Webb. There are whales that have calved in West
25 Mackenzie Bay, there are whales that have calved in
26 other bays, there are probably whales that have calved
27 in Shallow Bay. Now, what I'm saying to you is, why
28 do you conclude, or is it possible to conclude, that
29 the whales that propose to calve in Shallow Bay, if
30 any, during the year of the construction, will be able

Webb, Dabbs, Gunn, McCart,
 Jakimchuk, Rowe
 Cross-Exam by Scott

1 to successfully calve elsewhere in that year?
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Could we examine a worse
2 case situation? Let us assume that all the whales in
3 that area fail in one year to produce a calf, no crop for one
4 year, I would think that, well on the basis of total
5 numbers, averaged over four years, we may be talking
6 about 60% of calves produced. This is in proportion
7 assuming a proportionate calf drop, that total loss of
8 that percentage of the calf crop for one year would not
9 mean the demise of the Beaufort sea whale herd.

10 THE COMMISSIONER: It would
11 be a slight loss, that's what you would say.

12 A It would be a --

13 Q They'd all come back and
14 calve next year if the pipeline was built, that's the
15 point.

16 A Yes, that's right, and
17 the beasts are slow to mature, long to live, their
18 reproductive life is very great, and this kind of a loss
19 may not be noticed in terms of total numbers of whales
20 using the Mackenzie estuary in succeeding years. In
21 fact, the discreteness of the survey results may not
22 be able to record that difference in population.

23 But I would think that also,
24 going further if I may, that most certainly that would
25 have very little measurable impact upon the hunting
26 opportunities or the success of the hunt.

27 Q But aren't there a couple
28 of assumptions in that answer, first of all that the
29 whales will return to Shallow Bay and be able to calf
30 in the succeeding year, or secondly, that in the succeeding

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 year they will go somewhere else to calve?

2 A I'm assuming that they
3 will come back to the west Mackenzie Bay, that is
4 Shallow Bay area.

5 Q And you're also assuming
6 that they will be able to successfully calve there
7 the succeeding and following years.

8 A Yes, that's true.

9 Q Yes, and the alternative
10 assumption is that if they don't, they will go to some
11 other bay to calve.

12 A Yes, that option is
13 probably available for some of the whales. I haven't
14 leaned on it very heavily in my --

15 Q And I take it you haven't
16 leaned on it heavily because there isn't sufficient
17 knowledge to predict that a whale that is used to
18 calving in Shallow Bay will in fact calve somewhere
19 else.

20 A That's right.

21 Q Right.

22 A We do have knowledge
23 that numbers of whales in the three areas that appear
24 to be used as calving grounds varies from year to year
25 depending upon ice conditions and the availability of
26 the whales to reach those three concentration areas.
27 So there is some reason to believe that they are
28 interdependent to some degree; and we also have
29 observed movements very early in the period in which
30 the whales are in the estuary between these concentration

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 areas.

2 Q And I take it, Mr. Webb,
3 if those assumptions all turned out to be false, that
4 is that the Shallow Bay whales were unable to success-
5 fully calve again, that would be a significant diminu-
6 tion of the future populations

7 A A two-year -

8 Q A five-year, ten-year.

9 A Well, yes, if you want to
10 carry it to that degree, it most certainly would have
11 an effect.

12 Q And that of course is why,
13 I presume, in your paper you very, if I can put my
14 finger on it, you fairly refer to the risk that whales
15 may not return to calve if they are unable to become
16 accustomed to buried pipeline sounds. I'm referring on
17 page 2 where you say:

18 "Even if apprehensive at first, whales may be
19 expected to accommodate to the low level of
20 buried pipeline sounds during operation. Should
21 they fail to become fully accustomed, biological
22 consequences would be similar to those expected
23 during construction in July."

24 A That's right.

25 Q And you therefore
26 contemplate the possibility that the whales that come
27 to Shallow Bay to calve may never become accustomed
28 and that therefore may never calve there again

29 A I contemplate that
30 possibility, however I think it's a very unlikely

circumstance.

A As I indicated this morning.

A To the degree that whales have not been studied upon being subjected to that kind of a real or imagined barrier, yes. There never has been a cause and effect^{study} documented in the scientific literature.

A Well, there have been disturbance studies, sir. I'm using those as a basis for my statements.

A None that sustain that conclusion.

Q All right. You see the problem that I'm concerned about is for several weeks we've had Mr. Jakimchuk and Dr. Gunn chasing every bird and caribou and giving us learned papers on how they're going to behave and where they go and all the rest of it, and the same with Dr. McCart; and it seems to me that a good deal has been observed about those species. There's still some problems but a good deal is known about

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 how they react, we can see them to begin with, when
2 they're born, and I'm simply suggesting to you that
3 in the case of whales, knowledge is at a very preliminary
4 level.

5 A I would disagree with
6 that general statement.

7 Q Well, isn't it fair to
8 say that we have to, in the present state of knowledge,
9 contemplate the possibility that the whales that calve
10 in Shallow Bay may never calve there again?

11 I suppose you could contemplate
12 the possibility that whales would never come back to the
13 Mackenzie estuary again.

14 THE COMMISSIONER: Let me put
15 it this way.

16 MR. SCOTT: Is that something
17 that must be contemplated with regard to this pipeline
18 project?

19 A Not with regard to the
20 pipeline project. With regard to their own whims is the
21 main reason.

22 THE COMMISSIONER: Well, let
23 me just take you back a step.

24 Q You're of the opinion that
25 the vital areas for the whales is west Mackenzie Bay and
26 not Shallow Bay.

27 A Yes, that's true.

28 Q That's why you attach more
29 importance to your condition recommendation No. 3 than
30 recommendation No. 1.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Right.

2 Q Because you're more
3 concerned about Mr. Hollingworth's 177 barges plying
4 back and forth along Mackenzie Bay. Pardon?

5 MR. SCOTT: 375.

6 THE COMMISSIONER: 375 barges
7 plying back and forth along Mackenzie Bay than you are
8 about actual pipeline construction across Shallow Bay.
9 It's all part of the pipeline project but it's something
10 that you have to do a little thinking about, as Mr.
11 Hollingworth has done, to bring it into the whole
12 picture. Am I putting your position fairly?

13 A Yes, except that I would
14 add that my major concern with respect to the barge
15 traffic has to do with the hunting opportunity and
16 the success in the hunt, more so than the welfare of
17 the whales.

18 Q More so than what?

19 A Than the welfare of the
20 whales themselves.

21 Q Yes, you're saying that
22 it wouldn't affect the calving or post-calving phase,
23 but it would perhaps disperse the whales so that the
24 native hunters wouldn't be able to take any. That's
25 the point, is it?

26 A It would make it more
27 inconvenient for them, yes.

28 Q Well now, Mr. Scott's
29 point about the extent of your knowledge -- and when I
30 say "your" I mean the scientific community that you

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 represent, the extent of your knowledge of the behaviour
2 of the white whales of the Beaufort Sea, he suggests,
3 is at a fairly primitive level. Are you saying that
4 the possibility that excluded from Shallow Bay by
5 pipeline construction, that if they were excluded for
6 one summer by pipeline construction, driven out of
7 Shallow Bay, is it irrational to contemplate the
8 possibility that they might never return? Can I put
9 it to you that way?

10 A Yes, I would say that
11 is as near an impossibility as I can conceive, and I
12 use as a basis for that the observed reactions to dredge
13 activity around artificial islands that would be very
14 similar, and the dredge activity contemplated there
15 in the crossing of Shallow Bay; the attendant boat
16 activity, notwithstanding the barge traffic, that is
17 in the same general order. We have observed that in
18 fact around these islands the whales come back and
19 use the same general area, and I would expect that
20 they would react very similarly to the crossing of
21 Shallow Bay.

22 MR. SCOTT: Q But Mr. Webb,
23 there's no evidence that they return for calving,
24 is there?

25 A The evidence that they
26 return for calving is just as strong as the assumption
27 in the first place that the whole estuary is used for
28 calving.

29 Q Well, I take that to be
30 that the odds are 50-50.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1

THE COMMISSIONER: Well, I take

2

it that they use the estuary for calving.

3

A Yes.

4

Q I thought we knew that

5

much for sure.

6

A Yes, ^{if}/we can accept that

7

and we can accept that they return for calving around

8

the island, yes.

9

MR. SCOTT: Q Well now, why

10

are you so certain, if you are so certain -- and perhaps

11

you're not -- that the construction and transportation

12

exercise may not have its effects on calving in the

13

west Mackenzie Bay?

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 A Because the area
3 available to them and the area used by them in the
4 four years that we have observed them, is a very large
5 on. As you can see, by applying a twelve mile to the
6 inch scale to the air photos that I distributed this
7 morning, and by comparing those air photos to the maps
8 in our projects which indicates the concentration
9 areas, they're very large -- these areas that are
10 used during the period that they are apparently calving.
11 So large, that an adjustment of one, two, three or
12 four miles, which is greater than we've ever observed
13 in the face of barge traffic, can easily be made
14 without them having to leave this suitable habitat.

15 Q Have you tried your
16 hand for example, at drafting out for the applicant a
17 barge route that should be followed, if the barges
18 are to come in during the calving season?

19 A No, I've advised them
20 against barging during that time and I've been given
21 no indication to my recollection at least that they
22 would not go along with that suggestion.

23 Q Yes. Are there other
24 boats besides barges that to which you'd apply this
25 restriction?

26 A Not specifically and
27 it isn't that I'm selecting barges as a particular
28 kind of boat to be concerned about. I think it's
29 the frequency of their travel that is of concern.

30 Q Isn't it simply this,
Mr. Webb, that even as far as West Mackenzie Bay is

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 concerned, that to the extent that boat traffic through
2 that bay is increased beyond the traffic that now
3 exists, to that extent we begin to run risks with
4 respect to whales and whale calving?

5 A Yes, I think that's
6 a fair statement.

7 Q You're going to try and
8 tell us where that risk begins in terms of incremental
9 boat travel through the West Mackenzie Bay and into
10 Shallow Bay? That's what Mr. Hollingworth asked you
11 to do. He asked you to try and tell us where the risk
12 begins. Where we have to be worried. How many boats
13 we can add to the present increment before we're
14 running risks with the whales.

15 A Well, I've been asked.
16 I don't think I promised that I would identify that
17 magical figure for you. I will certainly look at our
18 existing data and see if there is some level of boat
19 traffic that has approached a threshold but I haven't
20 been able to do that.

21 Q I take it that you under-
22 stand Mr. Hollingworth to ask you the same thing about
23 air traffic?

24 A I thought ^{we} discussed that
25 fairly clearly and I would repeat, I am not concerned
26 about air traffic at acceptable elevations 2,000 feet
27 or whatever.

28 Q Well, is it 3,000 feet.
29 What's your recommended elevation?
30

A I have none. I'm

Webb, Dabbs, Gunn, McCart,
 Jakimchuk, Rowe,
 Cross-Exam by Scott

1 recommending against very low level flights. That is,
 2 very close to the surface during the period that the
 3 whales are there.
 4

5 Q Well, you see, all this
 6 if to be applicable, has to be converted into some
 7 precision so these pilots will know what they're supposed
 8 to do and you're the whale expert. We've heard from
 9 the bird expert on elevations. What do you think the
 10 minimum elevation is? You see, if you can't tell us,
 11 I don't know who can.

12 A For the sake of consistency,
 13 I would suggest two thousand feet. Let's not
 14 confuse the pilots.

15 THE COMMISSIONER: That's
 16 what?

17 A I am -- I think I
 18 understand that 2,000 feet is the level that is
 19 satisfactory as far as bird disturbance is concerned
 20 or lack of bird disturbance.

MR. SCOTT:

21 Q I take it that if that--
 22 have you any reservations at that level about numbers
 23 of flights?

24 A None whatsoever, no.

25 Q No. Have you any reservations -- do these stipulations apply, in your opinion
 26 to helicopters?
 27

28 A Yes, I would think they
 29 would equally, yes.

30 Q Well now, I understood

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 from what you said yesterday that as a matter of
2 preference, if you had your way, you would select
3 either one of the two routes that are shown on the map
4 behind you as preferable because they are further into
5 Shallow Bay.

6 A Yes.

7 Q Yes, and I take it from
8 that that in the same way, if your preference was
9 relevant or was determinative, you would select the
10 circum-delta route.

11 A I'm not too familiar
12 with the circum-delta route, but I presume it is far
13 enough away from the whales to be of concern, and if
14 that's the case, then its application would certainly
15 eliminate any possibility of interference with whales.

16 Q I take it that your
17 preferences, thus expressed, are significant preferences
18 because you recognize the risks in prediction and the
19 risks in the limitations of our knowledge about whale
20 conduct?

21 A It's in recognition of the
22 fact that I'm rendering an opinion on them which I
23 consider the best opinion on the basis of the
24 existing information.

25 Q Yes, and bearing in mind
26 the existing information and the limited knowledge
27 about disturbance tests, you're, I take it, particularly
28 conscious of the fact that subsequent events might
29 prove you wrong?

30 A I run that risk and I am

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 conscious of that fact any time I render an opinion,
3 sir, yes.

4 Q I take it that if
5 you were told as a matter of fact, that an oil pipeline
6 would follow the route of the gas pipeline, that that
7 would intensify your preference for a route further
8 away from Shallow Bay?

9 A Yes, I think that's a
10 fair statement, though. I would think that it would be
11 an incomplete statement for me to make unless there
12 was some rather intensive look at the kinds of things
13 that may happen and the frequency with which they may
14 happen which I think I stated this morning, I have not
15 done.

16 Q What we are talking about
17 at the moment is preferences and I take it that you've
18 given us your preferences for a gas pipeline and I
19 take it that if an oil pipeline was bound to follow the
20 route selected for a gas pipeline, your preferences
21 would be reinforced in favor of a route away from Shallow
22 Bay.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by SCOTT

1 A Yes, that's a fair
2 statement.

3 Q Just one thing, and it
4 was touched on this morning. Dr. Banfield recommends
5 that a warning system be installed, either for whales
6 or barges, I'm not sure who's going to be warned, but
7 do you know -- have you ever heard of any such thing?

8 A No I haven't, and I'm
9 not really sure how it would work. I'm not sure what
10 kind of sounds you would have to develop to be
11 assured that they wouldn't pass the warning system.

12 Q And indeed, I suppose
13 the risk, bearing in mind the sensitivity to underwater
14 noises, is that the warning system might in fact
15 terrify the whales.

16 A The opinion I got on
17 reading that, is that it was meant to frighten the whales.

18 THE COMMISSIONER: That was
19 what I thought he was getting at, too. However, maybe
20 we should see what he says when he comes along.

21 MR. SCOTT:
22 Q All right. Now, you
23 indicated to us that you were relying on certain
24 disturbance studies, and I don't know if I got this.
25 Which disturbance studies are you relying on?

26 A The four years of
27 observations by F.F. Slaney and Company.

28 Q Well, those are observations
29 that you have made on your transects, or on your
30 overflights, or what have you. But have any studies,
any controlled studies been made, of which you have

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 knowledge?

2 A What do you mean by
3 controlled studies?

4 Q Well, the disturbance
5 studies that you refer to are simply the observations
6 of your people about what happens to a whale when a
7 barge goes by, or about what happens to a whale when
8 an island is built. Is that correct?

9 A Essentially, yes.

10 Q And those studies are
11 made by flying over the area periodically, and looking,
12 seeing where the whales are?

13 A Yes, plus being in the
14 area. We had observers stationed on the island site
15 for periods of time, and also on boats.

16 Q I take it that there are
17 no studies, as there may be with reindeer or other
18 species, that are designed to measure the impact of
19 particular noises or sounds or events, on whales.

20

21 A We have not subjected
22 whales to artificial sounds.

23 Q Yes. And I take it you
24 haven't monitored the existing sounds.

25 A By acoustical devices?

26 Q By -- in any manner.

27 A I think we monitored the
28 sounds through the monitoring of the frequency of
29 boat traffic. That may be an indirect way of monitoring
30 sound, but certainly the presence of the boat indicated

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 a certain -- the presence of a certain sound level,
2 and we monitored the presence of the boats, but we
3 have not measured by means of acoustic devices, under-
4 water devices, sound underwater.

5 Q Well then any monitoring
6 is found in your four reports. That's what you call
7 monitoring.

8 A Any that has been done
9 by Slaney and Company, right.

10 Q Now, Mr. Jakimchuk --

11 A Excuse me Mr. Scott. I
12 would rather not leave that one there. I would suggest
13 that -- or ask perhaps what additional benefit
14 the monitoring of underwater sounds might generate,
15 in your view.

16 Q Well, I refer you to
17 Dr. Sergeant's evidence on that score, in which he
18 discussed two kinds of monitoring that could be done.
19 Are you familiar with any system that would enable the
20 construction crews to have adequate notice of the
21 arrival of whales, sufficiently in advance so that they
22 could shut down construction?

23 A I'm sorry. I thought
24 you were addressing the question to someone else, and
25 I was daydreaming. May I hear it again?

26 Q Let me come at it this
27 way. If there is a problem here, there are a number
28 of solutions to it perhaps. One is to time the
29 construction work.

30 A Right...

Webb, Dabbs, Gunn, McCart,
Jakinchuk, Rowe
Cross-Exam by Scott

1 Q The other is to alter the
2 route. Now we've dealt with those two. What I'm
3 suggesting to you is are you familiar with any third
4 way, any monitoring system, that would enable the work
5 to be shut down, which would remove the consequences
6 of the work, as far as calving whales are concerned?
7 Or is that just something that is unlikely to occur?

8 A It would be very difficult
9 to implement , I think because of the unpredictability
10 and the -- of the infrequent movements into Shallow Bay
11 that we've observed. It may be possible, but you would
12 have to keep a very close watch.

13 WITNESS GUNN: Mr. Scott, I'd
14 like to comment on that, if I might. I think it's
15 quite a reasonable operation to use sonic means to
16 record the movements of whales in a fairly circumscribed
17 area such as the entrance to Shallow Bay. I don't
18 think it would be terribly difficult or expensive to
19 do.

20 Q What would you propose,
21 Dr. Gunn, in this connection?

22 A I would use underwater
23 microphones, listening devices. Beluga whales have
24 quite specific sounds that they make underwater, and
25 I think these could be readily identified.

26 Q Well, that would give you
27 some notice of when the whales were passing by. What
28 time frame would it give you to shut down the construction?

29 A That all depends where you
30 locate your advance warning equipment, I would say.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q Well, where would you
2 locate it? What I'm looking for here is, is there
3 a third option. It seems to me quite conceivable
4 according to Mr. William's evidence, that this
5 project has to be constructed during the calving
6 period, in April through August. Now, if the route
7 isn't going to be changed, what I'd like to know is,
8 is there a scheme that will enable the contractor to
9 shut down for any substantial periods of time, when
10 alerted to the arrival of whales, or is that something
11 that is just silly?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 A I don't think it's silly
2 and I haven't had time to consider it, but if you had
3 one gate so to speak near the mouth of the bay, and
4 an intermediate point half-way to the construction
5 area and a third one close to the construction area,
6 I think that this would give you a pretty good measure
7 of the number and movements of whales involved.

8 Q Well, has Arctic Gas
9 considered this, Mr. Marshall.

10 MR. CARTER: Mr. Marshalls'
11 not here.

12 MR. SCOTT: Well, Mr. Carter?
13

14 MR. CARTER: We'll leave that
15 till Mr. Hemstock comes and you can ask him then.

16 MR. SCOTT: Well now, Mr.
17 Jakimchuk, I take that your evidence is in fact
18 based on Mr. Wooley's report, Mr. Wooley being an
19 employee of your firm, is that correct?

20 WITNESS JAKIMCHUK: That's
21 correct, as well as my own inspection of the alignment
22 in the field.

23 Q When was your inspection
24 of the alignment conducted?

25 A I was on surveys --
26 a couple of surveys in July of 1975.

27 Q These are the surveys
28 that are reported in Mr. Wooley's paper which is an
29 exhibit?

30 A It was during the same
month, but he conducted additional surveys.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
 Cross-Exam by Scott

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Q Well now, on page 43,
 -- on page 43, he says:

"Because the cross-delta route crosses more
 tundra area, it would have more potential for a
 conflict with mammals characteristic of tundra
 regions including Arctic fox and polar bear.
 Also, because this route cross the delta, there
 may be more potential conflict with muskrats although
 support facilities for the prime route would en-
 counter prime muskrat habitat in the delta."

And I take it that you agree
 with that?

A In general terms, I
 agree with it.

Q What you mean "in general
 terms". It was your firm's paper?

A At the level of generaliza-
 tion that the statements are made, I agree with them
 at that level of generalization.

Q All right. Then at
 page 46, the second paragraph when MrWooley says:

"The cross-delta route present potentially greater
 problems for muskrats that the prime route,
 because of the muskrat populations of the lower
 delta, Langley Island and Richards Island. These
 potential problems appear to be only local in
 nature and are not considered to be of major
 significance."

You agree with that?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Yes.

2 Q Yes, and I take the
3 effect of that is that the cross-delta route presents
4 these problems for muskrats at a greater level than the
5 prime route for the reasons given.

6 A That's correct, yes.

7 Q So that we may say
8 may we not that in terms of muskrat, the impacts of the
9 cross-delta route are likely to be greater than the
10 impacts for muskrat on any other route than of which
11 we -- of the two that are being considered at the
12 moment?

13 A On a conceptual basis,
14 I'd have to say yes, but I do not wish to imply that
15 those impacts will be significant because I don't feel
16 they will be.

17 Q No, but if the impacts
18 -- first of all, you recognize that muskrat are a,
19 prime object of the hunt in the delta?

20 A That's correct. There
21 an important species -- the most important species
22 in terms of the trapping economy, considering the
23 entire delta.

24 Q Yes, so that in selecting
25 a route, if impacts on muskrat are to be put in the
26 scale, they're put in the scale in favor of the
27 circum-delta route?

28 A If you consider -- I
29 don't consider that there will be a significant impact
30 on muskrat either way, Mr. Scott. As I say on a

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 conceptual level, the encounter with muskrat between
2 the pipeline alignment, occurs on the cross-delta
3 route to a greater extent than on the circum-delta
4 route, that's correct. But in terms of the impact
5 or the significance of that encounter, I don't think
6 it matters much either way.

7 Q Well, how about traplines?
8 Have you given any consideration to their existence?

9 A Yes, we have and
10 as far as the primary trapping areas in the Mackenzie
11 Delta go, it is my understanding that most of them
12 are located well south. The bulk of the trapping
13 located well south of the alignment where the higher
14 populations are and in closer proximity to the communi-
15 ties : Aklavik, Arctic Red River, Fort McPherson,
16 Inuvik.

17 Q I take that's a socio-
18 economic view based on your experience?

19 A No, I've reported
20 what I have seen in terms of the distribution of
21 trapping pressure on the delta.

22 Q Have you any information
23 as to the extent to which those who hunt in the delta
24 may or may not be dependent on the muskrat population?

25 A No, I don't.

26 Q Now, at page 46, Mr. Wooley
27 make the summary comparing the two routes and he says
28 that"

29 "The cross-delta route would be preferable for
30 the following animals: Dall Sheep, Porcupine

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 Caribou herd, beaver, moose, black bear, marten
2 wolverine and linx. The original prime route
3 would be preferable in terms of polar bear, Arctic
4 fox and the bluenose caribou herd. There is no
5 evidence to whether gizzly bear and muskrat would
6 be more greatly affected by one route or the
7 other."

8
9 Now, when we come to Dall
10 Sheep, Dall Sheep are cited as a reason why the cross-
11 delta route is preferable. Do I have that?
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 THE COMMISSIONER: That's what
2 I took.

3 A Yes.

4 MR. SCOTT: All right. Well now
5 on the previous page Mr. Wooley said that Dall sheep
6 wintering in the Mount Goodenough area will not be
7 directly affected by the cross-delta route. I suggest
8 to you that they won't be directly affected by the
9 old prime route either, will they?

10 A Not directly, but the
11 cross-delta route removes possibilities of disturbance
12 such as owing to aircraft, even much further than the
13 original prime route. In terms of direct effects, that
14 is alignment as it pertains to the range, you're
15 correct in stating that the alignment does not go
16 through the wintering range of the Mount Goodenough
17 sheep population.

18 Q Well, what I'm concerned
19 about is that if that be so, why do you put them on
20 the scale that favors the cross-delta route?

21 A Because the route is
22 more remote and the possibilities of even a peripheral
23 disturbance of that population is less. It's not a big
24 thing, Mr. Scott, but it's a point.

25 Q No, but you see, Mr.
26 Jakimchuk, the reason I'm asking is that you say that
27 you think the cross-delta route from the standpoint of
28 mammal c onsiderations is somewhat preferable and
29 your balance sheet includes the Dall sheep on one
30 side, and what I'm suggesting to you is that in drawing

Webb, Dabbs, Gunn, McCart
Jaki mchuk, Rowe
Cross-Exam by Scott

1 up a balance sheet it's not really fair to take the
2 Dall sheep into account on one side or the other, is
3 it?

4 A Well, this wasn't inten-
5 ded to be a balance sheet in terms of as an accountant
6 would look at something. These points are not weighted,
7 we have not assigned them any rating or any value, this
8 is the discussion that relates to some of the consider-
9 ations that we made in assessing these routes. You
10 will see further on in this report that one of the
11 factors that we consider to be most important is the
12 fact that the cross-delta routing is shorter in overall
13 length and therefore would have a considerably less
14 interaction with all species of mammals and their
15 habitat.

16 Q I take it that the same
17 thing could be said of the Porcupine caribou herd which
18 you've also put in the ledger in favor of the cross-
19 delta, that the impacts there are basically, as Mr.
20 Wooley says, going to be restricted to a few hundred
21 that, as he says on I think page 45:

22 "that descend to the proposed route in small
23 groups of up to 300."

24 A What is your question?

25 Q I'm suggesting to you
26 that leave aside for the moment the difference in lengths
27 of the two routes, what I'm suggesting to you is that
28 as far as mammals are concerned there is no preference
29 between one route and the other.

30 A Well, you've asked me to

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 leave aside the question of the difference in length,
2 and that is the main preference, the main point.
3 Leaving that aside, it is very difficult to indicate
4 a clear preference for one or the other.

5 Q All right.

6 A But there is in fact a
7 preference based on that point that you have left aside.
8 You always prefer the shortest route, given --

9 THE COMMISSIONER: Given equal
10 impact per mile.

11 A That's correct.

12 Q All right.

13 A Thank you, Mr. Commissioner.

14 MR. SCOTT: Q So can we put
15 you in this situation, that leaving aside the question
16 of the shortness of the route, there is on balance
17 nothing to choose between these two routes as far as
18 you're concerned from the point of view of mammals?

19 A Leaving that consideration
20 aside, I would say that's -- I could agree with that,
21 yes.

22 Q Well now, Dr. McCart said
23 yesterday that there were potentially 1,002 routes
24 crossing the delta, and in his case you'd only have
25 the mandate or the opportunity to examine and compare
26 two of them. Is that your position?

27 A I don't understand what
28 you've asked me.

29 Q Yesterday Dr. McCart
30 was asked to comment on the so-called Barry route.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A yes.

2 Q And some other potential
3 route, and he said that there were over 1,000 potential
4 routes through the delta, and that he was only in a
5 position because of the work he'd done to compare two
6 of them in a precise way. Now is that your position, or
7 are you able to compare the two other routes that are
8 shown on the board?

9 A Well, I commented on that
10 in my testimony yesterday and said in a general sense
11 we have made a comparison and have concluded there is
12 no significant difference between those routes shown,
13 from the standpoint of mammals, excluding the white
14 whale, no significant difference to mammal species
15 or their habitat. With the exception of site specific
16 information which we do not have for the Barry route,
17 and which we do have for the route proposed.

18 THE COMMISSIONER: Mr. Scott,
19 would this be a convenient time to adjourn? Could you --
20 I take it that you will be finished cross-examining this
21 panel in the morning sometime. Where do we go from
22 there? What happens next?

23 MR. MARSHALL: Sir, as far as
24 I'm concerned, it's my understanding that Mr. Hemstock
25 and Dr. Banfield should be here around noon tomorrow.

26 THE COMMISSIONER: Well, assuming
27 that they are fitted in somewhere during the day, what
28 happens after this point then?

29 MR. SCOTT: Well, Mr. Commissioner,
30 our witnesses are all here. It may be that it's impossible

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 to call them this week. We have one that we would
2 like to call next, Dr. Sprague of Guelph, who will
3 be here shortly, and we would like to call him tomorrow
4 so that he will be sure to get away by the weekend.

5 THE COMMISSIONER: All right,
6 what's he going to be talking about?

7 MR. SCOTT: He's going to be
8 talking about water.

9 THE COMMISSIONER: All right.
10 Well then --

11 M R SCOTT: And what I would
12 propose, if nobody objects, is that he should be called
13 next and that then Mr. Hemstock and Dr. Banfield should
14 be called, and that we should sit tomorrow night, if
15 necessary, bearing in mind that as I understand it, you
16 will have to turn to other matters at two o'clock on
17 Friday afternoon when the Coppermine people arrive.

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 THE COMMISSIONER: Yes, well,
2 I think Professor Jackson indicated to the people from
3 Coppermine, that just as we heard an earlier delegation
4 from Coppermine in the midst of formal hearings, to
5 suit the convenience of the delegation, we'll hear
6 this delegation when they arrive, which I take it is
7 sometime on Friday. So, that will be done when they
8 arrive, I suppose. All right, we'll sit then at
9 9:30 tomorrow, and we will plan on sitting tomorrow
10 night as well, and then carrying on Friday morning,
11 and perhaps setting aside the afternoon on Friday
12 for the Coppermine people. Now, they may not take
13 very long So, you might just think about the problem
14 of scheduling; and when you return a week Monday, --
15 that's the program is it, to return a week Monday?
16 That's the fifth of April. Okay, well we'll adjourn
17 until 9:30 then.

18 (PROCEEDINGS ADJOURNED TO MARCH 25, 1976)
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MACKENZIE VALLEY PIPELINE INQUIRY

Government
Publication

IN THE MATTER OF APPLICATIONS BY EACH OF
(a) CANADIAN ARCTIC GAS PIPELINE LIMITED FOR A
RIGHT-OF-WAY THAT MIGHT BE GRANTED ACROSS
CROWN LANDS WITHIN THE YUKON TERRITORY AND
THE NORTHWEST TERRITORIES, and
(b) FOOTHILLS PIPE LINES LTD. FOR A RIGHT-OF-WAY
THAT MIGHT BE GRANTED ACROSS CROWN LANDS
WITHIN THE NORTHWEST TERRITORIES
FOR THE PURPOSE OF A PROPOSED MACKENZIE VALLEY PIPELINE

and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND
ECONOMIC IMPACT REGIONALLY OF THE CONSTRUCTION,
OPERATION AND SUBSEQUENT ABANDONMENT OF THE ABOVE
PROPOSED PIPELINE

(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

March 25, 1976.

PROCEEDINGS AT INQUIRY

Volume 135

CANADIAN ARCTIC
GAS PIPELINE

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APPEARANCES:

Mr. Ian G. Scott, Q.C.,
Mr. Stephen T. Goudge,
Mr. Alick Ryder and
Mr. Ian Roland for Mackenzie Valley Pipeline
Inquiry;

Mr. Pierre Genest, Q.C.,
Mr. Jack Marshall, and
Mr. Darryl Carter for Canadian Arctic Gas
Pipeline Limited;
Mr. Reginald Gibbs, Q.C.,
Mr. Alan Hollingworth &
Mr. John W. Lutes, for Foothills Pipe Lines Ltd.;

Mr. Russell Anthony &
Pro. Alastair Lucas for Canadian Arctic Resources
Mr. Garth Evans Committee;

Mr. Glen W. Bell and
Mr. Gerry Sutton, for Northwest Territories
Indian Brotherhood, and
Metis Association of the
Northwest Territories;

Mr. John Bayly
or
Miss Leslie Lane for Inuit Tapirisat of Canada,
and The Committee for
Original Peoples Entitle-
ment;

Mr. Ron Veale and
Mr. Allen Lueck for The Council for the Yukon
Indians;

Mr. Carson H. Templeton, for Environment Protection
Board;

Mr. David Reesor for Northwest Territories
Association of Municipal-
ities;

Mr. Murray Sigler for Northwest Territories
Chamber of Commerce.

Mr. John Ballem, Q.C., for Producer Companys;

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1 Yellowknife, N.W.T.

2 March 25, 1976.

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4 MR. SCOTT: Mr. Commissioner,
5 the first item this morning, as agreed, relates to
6 Mr. Bayly's proposed evidence, of which all parties
7 have long since received copies. I understand from
8 our meeting the other night that Messrs. Marshall and
9 Hollingworth, and perhaps others, have objections to
10 it being tendered, and led, and it might be appropriate
11 for one of them to begin and state those objections and
12 then the issue can be canvassed.

13 M R. MARSHALL: As usual,
14 Foothills has agreed that Arctic Gas ought to take the
15 lead, sir. Counsel have met to discuss the question
16 of the evidence that Mr. Bayly proposes to call. It's
17 a panel on the history of information, research and
18 consultation with native people regarding petroleum
19 developments in the Western Arctic.

20 I have relayed to Mr. Bayly
21 my concern related to the form of the evidence. However,
22 as the evidence in question does not relate to my
23 client's application, I do not wish to delve into the
24 matters, those particular matters now. But I have in-
25 dicated to Mr. Bayly that in the event evidence in a
26 similar form is sought to be introduced on subjects
27 relevant to my client's position, I will object most
28 strenuously.

29 Having said that, though, sir,
30 my submission with respect to the relevancy of the

1 evidence that's intended to be submitted is this.
2 The evidence proposed to be introduced -- and it is
3 98 pages in length, sir -- is not relevant to either
4 proposed pipeline project, and I submit that it will
5 not assist you, sir, in the preparation of your report
6 to the Minister.

7 As the summary that was
8 circulated by Mr. Bayly indicates, and I quote:

9 "This panel will lead evidence for the purpose
10 of demonstrating that throughout the brief
11 history of petroleum development in the Western
12 Arctic, the native people of the region have
13 never been provided with what is, in their
14 view, adequate information about these
15 developments and their likely consequence."

16 Sir, I can well understand that Mr. Bayly wishes to
17 make that point before you. However, I think it has
18 been made, indeed it has been made countless times by
19 many, many witnesses, and I speak here of the community
20 hearings.

21 The evidence proposed to be
22 called is highly critical of the past efforts, or the
23 lack thereof, on the part of industry and government
24 to convey information pertaining to resource develop-
25 ment to the people in the communities, and to obtain
26 their input. The evidence is, I submit, of only
27 historical interest, as this Inquiry which is now in
28 its second year and it has visited some 30 communities,
29 has served to ensure that whatever may have been the
30 failures of the past, that with respect to the proposed

1 pipeline and those are the proposals that are before
2 you, sir, in every community, all people have been given
3 every possible opportunity to question the pipeline
4 proposals and to make their views known. In other
5 words, this Inquiry has learned from the mistakes of
6 the past, and it is for this reason, sir, that Mr.
7 Bayly's evidence will not, I submit, be of any assist-
8 ance to you at all.

9 I gather from my discussion
10 with Mr. Bayly that he has a second purpose in wishing
11 to present this panel's evidence, and that purpose
12 relates to land claims and the proof of historic usage
13 of the land. Insofar as that is concerned, sir, I can
14 only say that the evidence -- and here we are dealing
15 largely with Dr. Usher's evidence, I believe, --
16 is really second best. You have already heard the best
17 evidence, if you like, from the hunters and trappers
18 and the elders of the various communities that have
19 been visited, and surely from an evidentiary point of
20 view theirs is the significant evidence on this subject.

21 Those are my submissions, sir.

22 THE COMMISSIONER: Mr.

23 Hollingworth?

24 MR. HOLLINGWORTH: Like Mr.

25 Marshall, sir, my two objections relate to relevancy
26 and form. With respect to the form, I don't have that
27 much to say except that I do feel that perhaps Mr.
28 Bayly is trying to introduce evidence at this time
29 which was more properly brought in Phase 4 and I think
30 particularly of Gaile Noble's evidence, which although

1 on the lack theoretically, about the lack of government
2 consultation with native peoples particularly in the
3 delta region, it goes on to a rather prejudiced and
4 personal view of the situation in Alaska and the
5 Fairbanks area as a result of the pipeline construction
6 there.

7 Miss Allison's evidence is
8 probably the most relevant in that it deals with
9 experimental dumping, although it criticizes the
10 Beaufort Sea project, whose very head, Mr. Milne, was
11 a witness for COPE, and it seems to me that they are
12 caught in a bit of a quandry there, but that's for them
13 to decide, I suppose.

14 Insofar as relevancy goes,
15 I agree with Mr. Marshall, the evidence is second best
16 at best, and most of the points that are being made
17 by Dr. Usher have been made previously in the communities
18 and have been made very effectively.

19 Foothills and I are very
20 sympathetic with the native organizations wanting to
21 demonstrate land use and wanting to advance their land
22 claim; but I question, sir, whether there is any ad-
23 vantage to be gained by advancing this second best
24 evidence before formal hearings and with that in mind,
25 sir, I took a look at your preliminary rulings in which
26 you state very clearly that you want to hear from native
27 organizations about the nature and extent of their
28 land claims.

1 But then sir, you say on page
2 six of preliminary ruling number two, that you want to
3 hear that evidence in the communities. In my submission
4 sir, that is where that evidence has been going in
5 and properly so and that is where it is continuing to go
6 in, and properly so and this is not the proper form to
7 establish any claim relating to the use of the land.

8 I don't think I can add much
9 more. I had further remarks, but they've largely been
10 covered by Mr. Marshall.

11 THE COMMISSIONER: You said
12 that some of this evidence relates to experience with a
13 pipeline in Alaska. I didn't realize that -- I thought
14 it was about past failures on the part of the govern-
15 ment and the industry to consult with the native
16 people. How did Alaska get into this?

17 MR. HOLLINGWORTH: Well, part
18 of Gaile Noble's evidence relates to a group -- the
19 MDDGAG planning group which evidently went over to
20 Alaska to look into the situation there, and her claim
21 is that they went over and took a superficial look at
22 best or spoke to the wrong people or drew the wrong
23 conclusions or perhaps all of those factors, and she
24 then goes off onto what I consider to be a bit of a
25 tangent, discussing the situation as she saw it in the
26 Fairbanks area. The way it's written it's quite
27 clear that she draws the conclusion that a good many
28 negative features have arisen out of pipeline construc-
29 tion.

30 Now, if she wants to advance

1 that case, that's fine. But, I think it's for phase
2 four, not for now.

3 THE COMMISSIONER: Yes, but
4 it's clear development, but it's not exactly conforming
5 to the issue Mr. Bayly's seeking to develop in this
6 evidence, I take it.

7 MR. HOLLINGWORTH: That's
8 correct sir.

9 MR. BAYLY: Mr. Commissioner,
10 the objections of both applicants appear to be divided
11 into two parts. One is, objections to form, and the
12 other is objections to substance, and with regard to the
13 objections to form, I would submit that any objections
14 to form do not go to relevance which is the only thing
15 that this motion should be about today.

16 If the applicants want to test
17 the form, or indeed, if they want to test particular
18 things in the substance, I would submit sir that the
19 best way for them to do that is through cross-examina-
20 tion. I would submit that what you should be
21 considering today is whether the evidence which we
22 would propose to lead from this panel of Dr. Usher,
23 Miss Allison and Miss Noble and Miss Cournoyea --
24 Mrs. Cournoyea -- is whether it relates to issues that
25 should be before you sir, and I submit that for the
26 following reasons, the issues that are raised in this
27 evidence are relevant to you and must be brought before
28 you so that recommendations can be made.

29 I went over evidence that you
30 have heard to date sir on various impacts and you've heard

1 evidence of the impacts on people of whaling, the
2 church, the fur trade and to a limited extent, from
3 people like Dr. Hobart of the effects of oil exploration.

4 Now, this history or interpreta-
5 tion was given by people like Dr. Hobart, Dr. Helm,
6 Dr. Stager; three witnesses for the producers in Inuvik
7 and in the sense that Mr. Marshall, I think means that
8 this is second-best evidence, in that these people were
9 not there. They're giving historical interpretation
10 of necessity they aren't --

11 THE COMMISSIONER: Many of
12 them were. Priests in every village, virtually every
13 one of them spoke about things he had observed over a
14 lifetime.

15 MR. BAYLY: That's quite true
16 sir.

17 THE COMMISSIONER: That's --
18 what I'm concerned about is that you want to bring
19 Dr. Usher, Mrs. Cournoyea, Miss Noble and Miss Allison
20 forward to tell me that the government and the industry
21 have failed to consult fully or fairly or at all with
22 the native people in the planning and development of
23 industrial activity in the north. Now, that's what
24 you're trying to persuade me.

25 MR. BAYLY: That's correct sir,
26 and the reason for that is this: not because we're
27 interested in criticizing the past behaviour of either
28 government or industry, but you sir have invited the
29 people in the communities to talk about their reactions
30 to the future exploration and seismic work that will

1 necessarily follow any pipeline. Now, you've asked
2 them for the possible social consequences and some of
3 those social consequences you have heard in a fragmented
4 way from different individuals in the communities, has
5 had social impacts and is continuing to have social
6 impacts on the communities, partly because of the way
7 in which the plans are presented and the way in which
8 people can participate in the development planning.
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1 represents not only their interests, but the national
2 interests. They realize that these things may even
3 be out of your hands, sir, the questions of the national
4 interests; and Mrs. Cournoyea states this in her evidence,
5 that this is indeed the case, and the only measure --
6 the only way to get a measure of local control, or
7 local influence, on the decisions that are made on
8 resource development, will be to settle the land
9 claims; and I suggest to you sir that if we don't have
10 that, and we don't put in this kind of evidence, then
11 you may say in your report; land claims should be
12 settled before major development begins, and the
13 government may look through your report in vain for
14 reasons why this should be; and they may say to
15 themselves, it won't make any difference. We represent
16 the people of the north just as we represent all
17 Canadian people, so it doesn't matter the sequence
18 of events.

19 We submit sir that it's very
20 important, what that sequence of events is, and one
21 of the ways of showing that is to say, don't just look
22 at Alaska, or James Bay, or Fort McMurray, for the
23 impacts of petroleum development. Look where it's
24 happening in the north. See what the pattern has been;
25 and we'll make recommendations for how that pattern
26 can be changed, and that is the reason we're asking
27 that land claims be settled prior to major development,
28 and that's the crux of that evidence sir.

29 Now, any argument as to
30 whether it is the best evidence or not, I would submit

1 is something that is --

2 THE COMMISSIONER: That's
3 another question. That's Dr. Usher's evidence about
4 land claims, or the extent of land use and occupation
5 which seems to be another point. Another objection --

6 MR. BAYLY: I'm not sure if
7 that objection of Mr. Marshall's and Mr. Hollingworth's
8 relates to the evidence they have before him, or
9 anticipated evidence that he would give with land-
10 use and occupancy maps. I'm assuming though that
11 it's this evidence that's before you today sir.

12 MR. MARSHALL: I raised that
13 simply following our discussion with Mr. Bayly. I had
14 understood that he regarded this evidence as being
15 important in support of his argument on land claims,
16 and I felt that I should deal with it, in anticipation
17 of his raising it this morning.

18 MR. BAYLY: And we do sir, and
19 to avoid the confusion that Mr. Marshall may have had
20 from our discussion, there are two aspects of land
21 claims that are important. One is the extent of them,
22 because that will show you sir if there is a conflict
23 in intended land use, between the pipeline applicants
24 and the native peoples; but the other one is the
25 sequence that I've referred to, and it is for that
26 reason that we seek to call this evidence.

27 As I say, we seek to make
28 recommendations on future conduct. Now Mr. Marshall
29 has said too that this Inquiry has changed everything,
30 and with regard to the pipeline itself, that may be

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1 That is my submission, sir.

2 MR. BELL: Yes, I'd just like
3 to add my voice to Mr. Bayly's in urging the reception of
4 this evidence. I think that it is clearly relevant.
5 The substance of the evidence relates to the extent
6 to which native people feel they are involved in the
7 decision-making process that goes on with respect to
8 the north, and I think that the applicants -- at least
9 Arctic Gas -- might be surprised to learn that that
10 was not relevant.

11 Perhaps I could explain that
12 by referring to some of the material which has been
13 filed by Arctic Gas in support of their application.
14 In the volume entitled:

15 "Regional Socio-Economic Impact Statement,"
16 Volume 14-C, at the paragraph entitled -- the section
17 entitled:

18 "Political Background,"
19 the applicant makes the following statements. It says:

20 "The native people are increasingly involved in
21 decision-making and are acquiring political
22 influence."

23 It goes on to say:

24 "Nonetheless, many native people still have
25 the feeling of relative powerlessness in
26 influencing their own destiny."

27 And later on the applicant says:

28 "The new economic opportunities associated
29 with the proposed pipeline and related
30 development can be expected to broaden

1 political consciousness and the opportunity
2 for northern residents to participate in
3 the decision-making process."

4 I submit that that indicates
5 that the applicant clearly thinks that the subject of
6 participation in the decision-making process is one
7 of relevance. The objection that relates -- that is
8 of historical interest only, I think the answer to that,
9 sir, is that what happened in the past is a clue to what
10 may happen in the future and that much of the evidence
11 for that reason before this Inquiry has been what might
12 be characterized as historical. I don't think it can
13 be excluded on that ground.

14 As to the objections concerning
15 the form of the evidence, I don't think I could add much
16 to what Mr. Bayly said. So I would urge, sir, that this
17 evidence be received.

18 MR. SCOTT: Mr. Commissioner,
19 it's my submission that this evidence should be accepted.
20 I must confess that I was anxiously awaiting an oppor-
21 tunity to exclude some evidence to illustrate that our
22 Inquiry is finite and that the parameters are clear,
23 but I regret that having reviewed, and having read the
24 evidence, I don't think this is the appropriate occasion
25 to make that truth self-evident.

26 First of all, I think it is
27 clear when the evidence is read that there are parts
28 of it that are irrelevant. There are sentences that
29 are irrelevant. There are sentences that are emotionally
30 charged from one point of view, rather than from Mr.

1 Marshall's point of view. There are comments that are
2 almost editorial and perhaps non-scientific in nature.
3 But it seems to me that it would be impossible to
4 eliminate them without destroying the evidence as a
5 whole, and indeed we have not attempted even with this
6 panel to eliminate them. I am sure my friend, Mr.
7 Jakimchuk, won't object if I refer to his analogous
8 comment on the order-in -council and guidelines.

9 We accept that and take those
10 kinds of comments as spoken in good faith and measured
11 ultimately by you on the matter of weight. So it's not
12 possible to tear up this document to determine which
13 sentence is relevant and which is irrelevant. It must
14 be judged as a whole.

15 I think its justification can
16 be placed on even a broader ground than Mr. Bayly has
17 advanced. He's talked about the morals derived from
18 it in terms of consultation. I think that there's a
19 broader issue here, and that, I think, can be seen
20 by an example. If there were already constructed in
21 the Northwest Territories a gas pipeline that crossed
22 lands that native people live in, I can't conceive that
23 there is any doubt that you would be entitled and
24 anxious to examine that experience in order to judge
25 and assess the conflicts that arose on the frontier
26 when this development project then in existence, and the
27 people of the Territories met. You would do that because
28 you would want to know, because it's relevant to your
29 Inquiry, what happens when those things, when those
30 two forces meet and what the problems are and how those

1 problems can best be resolved.

2 Now leaving aside the Pointed
3 Mountain line, there isn't a project of this type in
4 the Northwest Territories, and I see these papers as
5 an attempt to find parallels of much lesser magnitude,
6 I concede in most cases, in which one is able to
7 illustrate what happens when a development force on the
8 one hand often represented or accompanied by the
9 government and the people who live in the Territory
10 meet in an effort to determine what the resulting
11 problems are, and to draw what morals one can about
12 how they can be resolved or lessened in impact.

1 So, I think that in that broad
2 sense, there is some meaning and some lesson to be
3 derived from these minor collisions -- relatively minor
4 collisions on the frontier, because they will tell us
5 the extent to which there may be a collision and what
6 we may learn about it, if this project proceeds.

7 I think, with greatest respect
8 to Mr. Bayly, that it perhaps downgrades the effect of
9 that evidence to say that it's only moral is that there
10 should be consultation. I would have ^{thought} that it's impact
11 is broader than that. Now, whether it be received in
12 phase three or phase four is, it seems to me, a question
13 that shouldn't trouble you sir. We've had some over-
14 lap and we will have more.

15 For those reasons, I think
16 the evidence should be received. Cross-examination can
17 take place and you will be able to assess the weight
18 that it's entitled to have when you come to make your
19 final conclusions and recommendations.

20 THE COMMISSIONER: Can I ask
21 a question, Mr. Bayly? Mr. Marshall made the point that
22 -- and Mr. Hollingworth made the point that at the
23 community hearings, I have heard the people who live
24 here discuss at length the failure by government and
25 industry to consult with them. So that on the record,
26 there is an awful lot of evidence to that effect.

27 Mr. Yates of the Department
28 of Indian Affairs and Northern Development gave evidence.
29 He is the Director of Northern Policy & Planning.
30 He was willing to concede, I think, when you cross-

1 examined him, that there had been a failure of consul-
2 tation in some measure at least. What is there to be
3 gained by reiterating that point? I understand the
4 point on which you seek to justify the evidence. I
5 understand Mr. Scott's point. They're both points
6 of a good deal of force, but isn't the point that you
7 seek to make and the point that Mr. Scott suggests
8 the evidence makes, isn't it one that has in a sense
9 already been made forcefully and effectively by the
10 people in the best position to know? The people who
11 live in the villages.

12 You weren't at the community
13 hearings in the valley, but we heard from the Indian
14 people and the Metis people. You were at the hearings
15 in the Inuit villages. It's all fresh in our minds.
16 We were just there two weeks ago and this sort of thing
17 was gone into at length. Is it really necessary to
18 your case to have these four people who know an awful
19 lot about the north and the interactions -- a good
20 word that I've picked up since the Inquiry began --
21 between government and industry on the one hand and the
22 people on the other hand.

23 That's -- I'm not really
24 questioning its relevance when I put to you in that
25 way. I'm simply saying, haven't I been this way before?

26 MR. BAYLY: Well sir, this is
27 a point that Mr. Marshall again brought up in our
28 discussion prior to this motion and the way I tried
29 to explain it to him was this sir; that if I were
30 representing a pipeline applicant, and I wanted to call

1 some evidence to show a case history in order to make
2 recommendations of how something should be done, perhaps
3 I would call it baseline information , I'd hire some-
4 body to do it. I'd have him prepare the evidence, as
5 a whole, and I'd have him put it forward.

6 I can't order up witnesses
7 that way in the communities, sir and my assessment
8 of what was said in the communities was that we have
9 parts of the puzzle. But we have no one that has put
10 in a case history. Perhaps because people don't think
11 in those kinds of terms. Perhaps because ^{the} people that
12 I have sought to call in this panel, because they were
13 working for an organization that acted as a hub for
14 this information coming in are in a better position
15 to gather and assimilate this information that the
16 individuals in the communities.

17 Certainly, the firsthand
18 evidence you have heard. But, I submit sir and I
19 looked at this very carefully before asking that this
20 evidence be put together, I submit that we cannot,
21 through a community hearing always present an entire
22 example. We don't force people to get up in the
23 communities. We don't pay them to get up. We don't
24 ask them to prepare something in advance, because we
25 want to make a certain point.

26 If they happen to do that,
27 that's because that's what they want to talk about,
28 and I submit sir that this is therefore not the same
29 as what you have heard, although you will recall as
30 this evidence is being presented to you that perhaps

1 Vincent Steen said something similar, or David Nasogalua
2 or one of the other people that you heard in the
3 communities.

4 It's for that reason that I
5 submit that it is not just the same as what you've
6 already heard. It also provides through the evidence
7 of both Mrs. Cournoyea and Dr. Usher an analysis. First
8 of all from the point of view^{of} some one who's been
9 working as a member of the board of directors of COPE
10 for some time and secondly, from the point of view of
11 a professional geographer and economist; an analysis
12 of what this may mean and what can be recommended in
13 the future to solve some of the problems that are
14 occurring and have occurred in the past.

1 THE COMMISSIONER: Do I take
2 it that you are throwing Miss Allison and Miss Noble
3 overboard?

4 MR. BAYLY: No sir, but the
5 evidence is presented in a number of sections.

6 THE COMMISSIONER: We had
7 kind of a compromise.

8 MR. BAYLY: It's just that the
9 role of both Dr. Usher and Mrs. Cournoyer was to, at the
10 end of the three-case history, to give, each to give
11 an analysis of the situation and to prepare some
12 suggestions that may be used to make recommendations
13 for final argument.

14 MR. SCOTT: Mr. Commissioner,
15 can I make one observation about your question? I
16 think perhaps an example will make our position clear
17 and if you'll permit I'll take Mr. Webb and Dr. Sergeant
18 as examples. Presumably you have heard a great deal
19 in the community hearings about the location of whales
20 and the way they behave from the people who see them
21 and hunt them on a regular basis. We no doubt also could
22 have evidence of the people who flew the transects and
23 they would attach photographs showing where the counts
24 were and so on, and that would be the raw data.

25 Then when Dr. Sergeant and
26 Mr. Webb come along, you may say, "Well, why do we
27 need them? We have all the raw evidence, we have the
28 data."

29 The reason we need them is
30 because they are knowledgeable about this subject, and

1 the reason we need them apart from the fact that they
2 may have experience like the natives, the reason we
3 need them is because they ^{are} /knowledgeable and because
4 they are capable of providing a meaningful analysis
5 of the data for you.

6 Now it seems to me that the
7 bulk of these papers in a different and much less
8 scientific field meet exactly the same test. You've
9 heard in the native communities a certain amount of
10 raw data. That raw data has been provided by other
11 sources, and what you have now presented to you in
12 these papers, is an analysis of that material provided
13 by knowledgeable and experienced people, and although
14 it may be seen traditionally to be a different order
15 of analysis because it deals with people and their
16 motivations and their reactions, rather than animals
17 and birds and fish, I find it very difficult to believe
18 that on that simple ground alone it should be treated
19 as different in quality, and therefore it seems to me
20 that what is attempted, whether it succeeds or not,
21 by Dr. Usher and the others, is to provide for the
22 raw data that has already been assembled, an analysis
23 and a meaningful interpretation advanced before you
24 simply to assist you one way or the other, and whether
25 it does or not is for you to say, much in the same way
26 that Dr. Sergeant and Mr. Webb in a different field
27 with a different background provide an analysis and
28 an interpretation for you.

29 MR. BELL: Could I just add
30 one more word, sir? Concerning the usefulness of

1 calling this type of evidence at the formal hearings,
2 when evidence on similar points have been made at the
3 community hearings, I think that the advantage to that
4 is that it provides an opportunity for other participants
5 to cross-examine on areas where they might not feel
6 comfortable cross-examining in community hearings and
7 where they might have a better opportunity to do so at
8 the formal hearings.

9 THE COMMISSIONER: Well, I
10 think that just disposing of Dr. Usher's evidence,
11 this is a side issue, we have heard evidence of the
12 land use and occupation in the villages in the Western
13 Arctic and I would be inclined to welcome a discussion
14 by Dr. Usher of the overall significance of that material.
15 He's been deeply involved in the land use and occupation
16 study, and I think it would be helpful to the Inquiry
17 to hear from him about that, in the same way that it
18 may be that we would want to hear from the people at
19 the Brotherhood who are responsible for the land use
20 and occupation study that resulted in the maps we -- that
21 were presented in evidence at the villages in the valley
22 last summer. That disposes of that.

23 The main issue, this evidence
24 of these four witnesses, I'll consider it and let you
25 know tomorrow morning. Will that be in good time?

26 MR. HOLLINGWORTH: That would
27 be fine for me, sir. If I could just add one more
28 remark, I think from the last comments of Mr. Bell, it's
29 assumed that there is very much an adversary process
30 going on here and I don't think that's necessarily the

1 case. I want to make it clear again the sympathy
2 which my client holds for the natives' aspirations
3 and their land claim aspirations. The question is
4 the relevancy of this material. My feeling is that
5 you've got your material in the communities.

6 Now Mr. Scott makes the case
7 that it's a tying together, and analogizes to Mr.
8 Webb and Dr. Sergeant. I don't think it's quite the
9 same with a good deal of this evidence. I think it's
10 new evidence. It purports to be new evidence about
11 the experiences of these people which is entirely second
12 hand, and that's what troubles me.

13 When I looked at the material
14 I wasn't too troubled from the point of view of my
15 clients' interest. I'm still not too troubled; but I
16 am troubled as a lawyer about this type of evidence
17 in the form in which it is going forward to you, and
18 I think that would only be apparent to you from the
19 reading of it, and it's obviously difficult to argue
20 something of that nature now, but I did want to make
21 those remarks.

22 THE COMMISSIONER: Well, Mr.
23 Bell said that you gentlemen might not have wished to
24 cross-examine some of the people at the community
25 hearings. There were a couple of trappers at Arctic
26 Red River that I don't think anyone would want to
27 cross-examine.

28

29

30

1 MR. SCOTT: I must say, my
2 reference to the adversary process related to the
3 posture between Arctic Gas and Foothills, rather than
4 any other.

5 THE COMMISSIONER: All right,
6 well I'll let you know at 9:30 in the morning, and
7 we'll carry on then with your cross-examination, Mr.
8 Scott.

9 MR. MARSHALL: If I may, Mr.
10 Scott, there are a couple of matters that I ought
11 to deal with. Mr. Jakimchuk assures me that his
12 list of recommendations has been completed and it's
13 on this morning's plane, so we should have that
14 available for distribution. Dr. McCart has provided
15 me with a report from Aquatic Environments Ltd.
16 entitled "Water Availability Along The Arctic Gas
17 Pipeline Route From Prudhoe Bay Alaska To The Mackenzie
18 Delta, Yukon Territory". We'll arrange for sufficient
19 copies to be brought up next week from Calgary. In the
20 meantime , we'll have this copy of the report in our
21 office, and I'll file that report as an exhibit.

22 Dr. McCart also gave to me today
23 a report entitled "Aquatic Monitoring Of The Shallow
24 Bay Trenching Experiment", done by Aquatic Environments
25 Ltd. This report ought to have been on the list of
26 relevant studies, filed by the panel, and it was not
27 and I apologise for the omission. There's also a
28 second report that's in that category. Mr. Webb in
29 his evidence referred to a matter covered by this
30 report. He was asked a question about pipeline noise,

1 and he referred to some work that had been done on it.
2 I've received from him a report that's entitled, "Report
3 On Pipeline Noise Studies", done by P. Sidey, dated
4 September 26, 1975. This is a six page report. I have
5 only Mr. Webb's copy of it, but I am arranging for
6 an unmarked copy to be sent up on the -- on telecopier
7 so it'll be available.

8 This is a report, as I understand
9 it, that was undertaken by a summer student who worked
10 for Arctic Gas. Mr. Rowe is familiar with the report.
11 This report ought to have been on the list of reports
12 that Mr. Hemstock appended to the evidence of the panel,
13 and for some reason was overlooked, and again I
14 apologise for that, if it has inconvenienced any of
15 counsel, not having this report, I am prepared to
16 recall the witnesses at dates suitable to the convenience
17 of counsel, to have them cross-examined on the matters
18 covered in the report.

19 There are two other matters
20 as well. I believe Dr. Gunn is ready to respond to the
21 request for some information that was made by
22 Mr. Hollingworth; ^{perhaps} that ought to go on the record before
23 cross-examination goes on.

24 MR. BAYLY: Before he does,
25 Mr. Commissioner, I'm just wondering. It appears that
26 we'll get Mr. Jakimchuk's company's recommendations,
27 perhaps at the time or shortly after he's departed, and
28 there may be no need to ask them any questions about
29 them, but if there is, I'm hoping that Mr. Marshall
30 will be able to provide us some opportunity, either in

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In Chief

1 writing, or in person from Mr. Jakimchuk.

2 MR. MARSHALL: Fine.

3 MR. SCOTT: Mr. Commissioner,
4 can the timing of that be left to a counsel meeting?
5 It seems to me quite conceivable that a number of the
6 panelists will have to be recalled in view of this
7 material, and Mr. Jakimchuk's recommendation, and we'll
8 be able to fit it in later on if it's necessary. Perhaps
9 the cross-examination should just proceed as if these
10 reports were not filed.

11 MR. MARSHALL: Well, I leave
12 that up to counsel. As I say, I'm prepared to bring
13 them back.

14 DIRECT EXAMINATION BY MR. MARSHALL (CONTINUED):

15 ROBERT WEBB
16 DONALD DABBS
17 W.W.H. GUNN,
18 PETER J. MCCART
19 RONALD JAKIMCHUK
20 DOUG ROWE, resumed:

21 Q Dr. Gunn, you were asked
22 to provide some information to Mr. Hollingworth, I
23 believe.

24 WITNESS GUNN: Yes, that's
25 correct. Mr. Hollingworth asked me to provide information
26 about concentrations of moulting waterfowl in the vicin-
27 ity of Shallow Bay, and overnight we reviewed the infor-
28 mation at hand, our own data, and those of Slaney & Com-
29 pany with the Environment Protection Board, and if I can
30 summarize the information that we found on this subject
it's not a great deal.

There are some concentrations
of swans in the vicinity of Tent Island, in the region
of West Mackenzie Bay. There are some concentrations
of moulting waterfowl in Mallik Bay, and other concentra-
tions of ducks out in the vicinity of Parsons

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1 Lake, some concentrations of geese on the offshore
2 islands. Apart from that, no great concentrations of
3 moulting waterfowl in the delta. On the other hand,
4 it could be said, I think quite safely, that virtually
5 every pond and lake and creek has its own quota of
6 moulting ducks in late July and early August, but they're
7 widely distributed throughout the delta.

8 MR. MARSHALL: Thank you Dr.
9 Gunn, and finally, Mr. Commissioner, Mr. Webb indicated
10 to me this morning that in looking at his prepared
11 evidence, and considering the cross-examination, he
12 has realized that he had an additional recommendation to
13 Arctic Gas, that he neglected to include in his list
14 of recommendations, set out in the prepared direct
15 evidence, and I thought that in order that it would
16 be clear what his recommendations had been, that he
17 ought to deal with that this morning, so that if counsel
18 wish they can cross-examine on that. Mr. Webb, could
19 you deal with that other recommendation that was not
20 listed in your prepared ^{direct} evidence?

21 WITNESS WEBB: Yes, Mr. Marshall.
22 I haven't written it out, but essentially it had to
23 do with the possibility of the spoil material from
24 the ditch, during the trenching process across Shallow
25 Bay, being allowed to accumulate in such a manner that
26 the heavier particles settle very close to the ditch,
27 or trench, forming what may be a physical barrier
28 to whale movement across part of Shallow Bay. My
29 feeling is that this is a possibility, but I have not
30 had available to me geotechnical information indicating

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 the size of the material, or the likelihood of this
2 happening. If it was proven to be a possibility upon
3 closer inspection, I think it could be easily avoided
4 by care taken to distribute the spoil materials over
5 a broader area, so that a physical barrier would not
6 be formed.

7 My concern is based essentially
8 on the shallow nature of the bay over most of the
9 crossing, and in fact, if this material were to remain,
10 and form the basis of sand bars, it could possibly
11 restrict the movement of whales to some degree.

12 MR. MARSHALL: Thank you sir.
13 Those are the preliminary matters I thought should be
14 dealt with before Mr. Scott carried on with his cross-
15 examination.

16 CROSS-EXAMINATION BY MR. SCOTT (CONTINUED):

17 MR. SCOTT: Mr. Webb, when did
18 you make that recommendation to Arctic Gas?

19 A I discussed it with
20 Northern Engineering Services people a few weeks ago,
21 and the matter had been overlooked, for which I
22 apologize.

23 Q To whom did you make the
24 recommendation?

25 A To Mr. Hollingshead.

26 Q I see. Now, Mr. Jakimchuk,
27 dealing with what is called the Barry route on that
28 map behind you, in your judgement --

29 THE COMMISSIONER: That's the
30 middle line.

MR. SCOTT:

Q -- that's the middle

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Jakimchuk, Rowe
Cross-Exam by Scott

1 line. Are there any advantages to be gained, or any
2 disadvantages in your view, in terms of adjusting the
3 prime route in any direction, at any place?

4 WITNESS JAKIMCHUK: You'll
5 have to come again on that Mr. Scott.

6 Q All right. Let me begin
7 again. Take the prime route first, the red line. In
8 mammal terms and in terms of potential impacts on
9 mammals, are there any advantages to be gained by
10 any adjustments in that route whatever?

11 A In the prime route?

12 Q Yes.

13 A That's a difficult one,
14 Mr. Scott. There are advantages on a site specific
15 basis, which may become disadvantages if we had site
16 specific information on a newly ^ajusted route. As I
17 stated before, we have not done any detailed study of
18 the Barry route, or any specific alignment, other than
19 along the corridor of the prime route, so to name an
20 advantage, for example; it would -- an adjustment
21 northward of that prime route would impinge more
22 closely on grizzly bear denning habitat and fox
23 habitat, Arctic fox denning habitat. An adjustment
24 southward would impinge moreso upon habitat of higher
25 quality fur muskrat.

26 Q Well, what I'm getting
27 at Mr. Jakimchuk, dealing with the prime route, is
28 it occurs to me that mammalogists like yourself must
29 have at least in the recesses of his mind, certain
30 changes that he favours. I wish it didn't go here, I

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 wish it jogged in that direction a little bit more. Have
2 you any of those things, or are you totally satisfied
3 with that route, in terms of mammal impact?

4 A Well, any route has a
5 degree of impact, Mr. Scott. I have stated that I feel
6 that the impact is not going to be highly significant,
7 in comparison to the original prime route. It's very
8 very similar. I've already gone on record as saying
9 that.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q Well, that's the general
2 question. What I'm asking you is more particular and
3 maybe you can't answer, if you haven't examined it.
4 But, with regard to the prime route, are you harboring
5 any -- in your mind, any changes, big or small, that
6 should be made in it? Have you any unhappiness with
7 any portions of it?

8 A I suppose that I would
9 prefer not to see that prime route go through water
10 bodies, Mr. Scott. When I speak of water bodies, I
11 mean ponds now. There are five of them. I would prefer
12 that they didn't go through water bodies. However,
13 the significance of going through those is not great
14 in my mind.

15 When you speak of the prime
16 route, however, let me ask you're just referring to
17 the east - west routing there, are you?

18 Q Yes.

19 A Then, even in the recesses
20 of my mind, I have no specific changes aside from
21 preferring it not to go through water bodies.

22 Q Yes, well -- I'm sorry,
23 are finished?

24 A I'm just thinking. Yes,
25 I'm finished.

26 Q Well now, dealing with
27 Dr. Barry's route, does -- have you any views as to
28 whether it crosses an area of higher muskrat or beaver
29 population or lower muskrat or beaver population?

30 A No, Mr. Scott, I testified

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

yesterday that it approaches areas of higher quality habitat for muskrat and does not really approach areas of higher quality for beaver which are even further south in the delta.

Q All right. Now perhaps I asked this yesterday. Are you able to assess by comparing Dr. Barry's route and the prime route as to whether one of them crosses greater trapping area?

A I don't believe that either of them are crossing areas of the greatest trapping significance which, to my knowledge, are much further south in the delta.

Q Do you think that either the prime route or Dr. Barry's route would in any way affect the ability of people to harvest muskrat in those areas?

A I think it might have some marginal improvement on their ability to harvest muskrat by way of providing access along the right-of-way. But, once again, the populations are not that high and that's why very few people trap in that area. Any effect I think would probably result in a marginal improvement owing to access.

Q Well now, Mr. Jakimchuk, I'd like to ask you to help me compare the cross-delta route with the circum-delta route and I begin by suggesting to you that there will be no major difference in impact along the two routes from Richards Island to Thunder River. That's relatively clear, isn't it?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Yes, that's correct.

2 Q Yes. So that when we
3 compare the impacts of circum-delta versus cross-delta,
4 that comparison, apart from length, is going to rest
5 when one looks at the delta proper and in short, the
6 Shingle Point to Travaillant Lake section.

7 A Well, I would not include
8 Travaillant Lake in the delta proper myself, Mr. Scott.
9 I'd like to refer to a map, if you want to be that
10 specific.

11 Q All right, but in
12 comparing the two circum-delta --

13 A Yes.

14 Q -- and cross-delta, the
15 comparison, apart from distance is going to stand or
16 fall on the two routes between Shingle Point and
17 Travaillant Lake.

18 A O.K.

19 Q Yes. Well now, Dr.
20 Banfield in his summary of evidence which we have, has
21 listed certain concerns which he says weigh in favor
22 of one of those routes rather than the other. A number
23 of them, we have already dealt with, but one of the
24 grounds he gives for preferring the cross-delta is that
25 it avoids the traditional hunting territory, traplines
26 and fishing camps of the people of Aklavik, Fort McPher-
27 son and Arctic Red River. Now first of all, have you
28 been able to do any studies or form any opinion as to
29 the extent to which the people of those communities may,
30 in addition, use lands that are covered by the cross-

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 delta route between Shingle Point and Travaillant Lake?

2 A I have made no studies
3 of that, Mr. Scott. I notice that point was made in
4 Dr. Banfield's evidence as well as Mr. Hemstock's
5 evidence. It all depends on what you call a study.
6 You know, I am aware of where the focus of trapping is ,
7 for example, with respect to those mentioned communities
8 and there's no question in my mind, for example, that
9 there's a greater degree of activity in proximity to
10 those than in the proximity to the cross-delta routing.

11 Q Yes. It seems to me,
12 Mr. Jakimchuk that before the avoidance of the tradition-
13 al Aklavik hunting ground can be cited as a reason for
14 one route or the other, however, we have to know to
15 what extent those same people may use lands on the cross-
16 delta route and we have to know the extent to which
17 people located elsewhere may use lands on the cross-
18 delta route. You agree with that, don't you? .

19 A I agree with that, and
20 I'm saying at a certain level of generalization, I
21 feel that there is that knowledge is available.

22 Q All right. What people,
23 in fact now use the cross-delta route or lands in that
24 neighborhood for hunting and trapping purposes?

25 A Well, I would like to
26 defer that question to those who testified on that
27 point, Mr. Scott.

28 Q Well then, could it be --
29 would it be fair to say that for your own part, in
30

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 selecting one route over the other, you wouldn't propose
2 to rely on the fact that the cross-delta route
3 avoids the traditional Aklavik hunting area, because
4 you don't know what may upset that and what may be upset
5 by using the cross-delta route.

6 A Well, I don't think I
7 did rely on that, Mr. Scott.

8 Q All right, well --

9 A It doesn't appear in
10 my evidence or in our report.

11 Q Well, that's the point.
12 Dr. Banfield relies on it and do I understand that you
13 don't rely on it?

14 A In terms of making the
15 biological impact decision, the decision relating
16 to mammals, I did not rely on the hunting and trapping
17 and fishing area information. But I must point out,
18 Mr. Scott that in conducting studies of fur bearing
19 mammals, one is always very interested in the implications
20 of trapping and over the course of the years, we have
21 gathered considerable amount of information on species
22 trapped, where the trapping areas are. We have hired
23 trappers to assist us in our studies and that information
24 has found its way into the biological report series.

25 So that is why I have some
26 degree of confidence in saying that the areas, for
27 example around McPherson to the south and east of
28 McPherson are more important for trapping than Shallow
29 Bay is. You know, we do have some information.

30 Q Well I understand you have

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 some information but as long as I understand, Mr.
2 Jakimchuk, that you haven't taken that into your balance
3 in selecting one route over the other, I'm content.

4 A I think that is a
5 legitimate item for a balance, but it's not one that
6 I addressed because I was looking at impact on the
7 mammals themselves.

8 Q Yes. All right. Well
9 now, you say that you -- I forget the word, but that
10 you marginally prefer the cross-delta over the circum-
11 delta and I want to put this proposition to you and
12 it may be that you felt that --

13 A I said we somewhat prefer.

14 Q All right.

15 A But marginally is
16 reasonably acceptable to me.

17 Q Thank you Mr. Jakimchuk.
18 You somewhat marginally prefer the cross-delta to the
19 circum-delta. Well now, you may have answered this,
20 but I just want to have it clear. If it were stipulated
21 that an oil pipeline would follow the route cross-delta
22 or circum-delta that you had selected. Would that have
23 any change -- would that effect any change in your
24 choice?

25 A Well, my analysis was
26 related to the gas pipeline, number one. Number two,
27 I believe I've already testified as to what I feel
28 are the different implications of an oil pipeline so
29 that I assume that my opinion would change, but I
30 don't know just in what direction, I'd -- you know,

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Scott

1 that opinion has not actually formed.

2 Q I see. Dr. Gunn, when
3 you were asked the other day about the competing routes,
4 if I understand it, your position is this; that you
5 way back in time, you prefer the interior route first?

6 WITNESS GUNN: Yes.

7 Q Yes. Your second choice
8 if one must go the Yukon Slope way, is the lowest
9 possible line down Shallow Bay, shown on the map
10 behind you? I'm sorry, that circum-delta is your
11 next choice.

12 A Yes.

13 Q Yes. If circum-delta
14 fails you, you then prefer the lowest of the three
15 lines on the map behind you?
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Yes.

2 Q And that if that fails
3 you, your batting average by that time will be dis-
4 astrous, but if that fails you you then are confronted
5 with the main route and Dr. Barry's route and I think
6 you said at page 20179 that it was difficult to choose,
7 but you thought you preferred the mainline.

8 A That's what I said.

9 Q Yes, and I think I under-
10 stand from reading your evidence that the reason you
11 selected that was because you were of the view that
12 the staging of snow geese as a result of the work you
13 had done and the work you had reviewed, was such that
14 Dr. Barry's route on the east side of Shallow Bay
15 crossed through more intense locations of them than
16 the mainline route did.

17 A Snow geese and white-
18 fronted geese and brant geese.

19 Q Well, first of all you
20 provided in support of that maps that were prepared
21 by your counters in 1975.

22 A Yes.

23 Q And one of the maps
24 has to do with dark geese, is that correct?

25 A One of the maps deals
26 with white-fronted geese, brant geese, unidentified
27 dark geese, and swans.

28 Q Well, with the exception
29 of swans, aren't those all generally referred to as
30 dark geese?

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 A Yes.

2 Q And I take it that it
3 is sometimes difficult from aircraft to determine
4 which kind of dark geese you're actually seeing.

5 A If it is, then we call
6 them dark geese.

7 Q Right. Well now, would
8 you agree with me that looking at the 1975 map and
9 for dark geese, that Dr. Barry's route on the east
10 side of Shallow Bay is not very different in terms of
11 crossing dark geese found there in 1975 than the
12 mainland route?

13 A Yes, I agree it's very
14 similar, that's why I had difficulty in making a choice.

15 Q So that between the
16 mainline route and Dr. Barry's route, it would be, as
17 far as dark geese are concerned, six of one and half
18 a dozen of the other.

19 A That's a fair enough
20 statement, yes.

21 Q Well, now can we come
22 to the snow geese and you pointed out, as I think, the
23 major justification for your preference that Dr.
24 Barry's route on the east side particularly passed
25 through what appeared to be in 1975 a concentration of
26 snow geese.

27 A Yes.

28 Q And that therefore it
29 was less preferable in your judgement than the mainline.

30 A Again there's very little

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 choice. If anything, the choice could be affected by
2 the concentration of geese found on the west side in
3 1975, which is avoided by the mainline but which Dr.
4 Barry's route goes through.

5 Q Yes. Well, let me
6 suggest to you that in 1975 there were unusual snow
7 patterns that forced the snow geese to go further into
8 Shallow Bay than they normally would. Would you
9 agree with that?

10 A Yes.

11 Q And so that in a normal
12 year in which those snow patterns don't reoccur, it is
13 likely that the snow geese will be found further north,
14 rather than further south.

15 A Well, we have a map
16 indicating that, the position of the geese in a similar
17 time of year in 1973 and 1974, and that is to
18 be found on -- I can show you that map, it's in our
19 Biological Report series, Volume 30, chapter 1, page
20 5, which I can take over to you, if you like.

21 Q All right.

22 A The scale on that map
23 is rather small, but I think we can trace it out from
24 the map that's on the wall.

25 Q Five and page --

26 A It's on one map, and the
27 dark geese are on the other one, there's a tab there.

28 Q Well, let's deal only, if
29 we can at the moment, with snow geese.

30 A All right.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 I can describe it, if you like,
2 as I look at it. In that map the areas of concentration
3 in '73 and '74 are marked separately and there's a good
4 deal of overlap. Sir, would you like a copy of that?

5 THE COMMISSIONER: Yes.

6 A On the Barry route --

7 MR. SCOTT: First of all --

8 A -- all right.

9 Q -- Dr. Gunn, could I ask
10 you to tell us where the mainline runs with relation
11 to page 5 and the 1973-74 figure?

12 A You have the advantage on
13 me, you have the maps; I don't.

14 THE COMMISSIONER: Why don't
15 you draw it on both these copies?

16 A What I can do, Mr. Scott,
17 we have newspaper cutouts we can put on this map.

18 MR. SCOTT: Perhaps I can ask
19 the questions without it, sir.

20 Q What I'm suggesting to
21 you is that in 1973-74 the mainline ran through the
22 hatched areas that indicate snow geese.

23 A That is correct.

24 Q And I'm also suggesting
25 to you that the Barry line ran just to the south of
26 those hatched areas.

27 A It certainly runs to the
28 south of '73 and it's just on the margin of the area
29 of the southern limit of '74.

30 Q So would you agree with

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 me that we've dealt with '75, and I understand what
2 you're saying about that; that with respect to '73 or
3 '74, the mainline runs through the snow goose populations
4 that are there and the Barry line runs either just at
5 the bottom or slightly below.

6 A Correct.

7 Q Yes, so that for '73-'74
8 the Barry line for snow geese would be the better line.

9 A Yes.

10 Q Well now, I also suggest
11 to you that --

12 THE COMMISSIONER: Better than
13 the main route?

14 A Better than the main
15 route, yes.

16 MR. SCOTT: Q I also suggest
17 to you, Dr. Gunn, that in the last 18 years from
18 1969 until 1975 -- I'm sorry, 1959 to 1975 -- the
19 snow goose, snow geese have staged north of the
20 Barry line.

21 A We don't have the infor-
22 mation but I question that on the basis of the weather
23 data from the North Slope.

24 Q Well, let me put it
25 this way. An observer would be the best judge.

26 A Yes.

27 Q And all we know is
28 that the Barry line intersected with the snow geese,
29 according to your diagram, in one year, in 1975.

30 A Right.

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Cross-Exam by Scott

1 Q The mainline intersected
2 with the snow geese on each of the three years for which
3 you have records.

4 A Correct.

5 Q And that, I take it that
6 on those three years alone, would you not give a
7 preference to the Barry line from the point of view
8 of snow geese?

9 A Yes, I would, on a
10 marginal basis.

11 Q All right.

12 A It's so close that it
13 gives me some concern. It's not a clear-cut distance
14 between the Barry line and the area used by the geese,
15 but it definitely is marginally better, yes.

16 Q And sometimes in these
17 routing problems we have to be satisfied with marginal
18 improvements.

19 A I agree.

20 Q Yes, and this would be
21 one of them?

22 A O.K.

23 Q Yes, and I take it that
24 your view would -- that if you were satisfied that the
25 snow geese had staged north of the Barry line con-
26 tinuously from 1959 to 1975, if you were satisfied
27 of that, your preference for the Barry line would be
28 more than marginal, but would indeed be firm and
29 substantial, if you were satisfied of that.

30 A I think that that

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 evidence would give it greater weight.

2 Q Well now, are you aware
3 that from 1958 to 1974, snow geese staged heavily along
4 the east shore -- sorry, may I withdraw
5 that question, I had the facts wrong.

6 Do you agree that the west
7 side of Shallow Bay is regarded at least by the advisors
8 to the Environmental Protection Board as a prime swan
9 nesting area?

10 A I think that the area
11 from about the proposed crossing westward towards Tent
12 Island is one of the two important nesting areas for
13 whistling swans in the delta.

14 Q Yes, and that is also an
15 important nesting area for ducks and other shore birds?

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Webb, DAbbs, Cunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A It is fairly important
2 for ducks, and shore birds. There are -- I think the
3 Environment Protection Board lists four or five
4 species of shore birds, quite a few species of ducks;
5 and the density figures that we have been able to
6 obtain, they're not very clear, but the indication is,
7 that they nest -- the ducks nest in that region in
8 moderate numbers, as far as the delta is concerned.

9 Q And the critical period
10 for that nesting in this fairly important area, is
11 June, July, and early August?

12 A Yes.

13 Q And that nesting period
14 is accompanied shortly thereafter by moulting period.

15 A Well, the moulting period
16 begins in late July, and runs -- late July and early
17 August, into mid-August.

18 Q So that any disturbance
19 during the period, let us say, from June through August,
20 in the swan -- in what you've described as this fairly
21 important area, is going to have some adverse impacts
22 on nesting or moulting birds?

23 A I think that depends on
24 the type of disturbance and the frequency of disturbance.

25 Q Yes. Well, let me put
26 this proposition to you. Dr. Barry tells me that he
27 regards as preeminently important for birds, the sedge
28 lands that move down to the ocean. Do you agree
29 with that?

30 A Yes.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q Yes. And he says, dealing
2 with the west side of Shallow Bay, that the line he
3 has chosen, which is on the board behind you, is a
4 line that is designed to be in the -- on the edge of
5 the willow grove, and therefore leave the sedge land
6 unimpeded; and would you agree with that?

7 A Yes, I understand that.

8 Q And I take it therefore
9 that looking only at the west side of Shallow Bay, you
10 would prefer any route which avoided the sedge lands
11 almost entirely, and clung to the willows?

12 A I think there are trade-offs
13 in it, but on balance I would agree, yes.

14 Q And therefore, I take it
15 that looking at Dr. Barry's line as opposed to the prime
16 route on the west side of Shallow Bay, you would have
17 no hesitation in preferring Dr. Barry's line?

18 A Well, we have that problem
19 that it runs through the area used by the snowgeese in
20 '75.

21 Q Right, well let's leave
22 that aside. In terms of protecting the sedge areas?

23 A It certainly does that, yes.

24 Q Yes. And on that ground,
25 it would be preferable?

26 A Yes.

27 Q And the reason you have
28 some hesitation is because of the staging of snowgeese
29 in that area, in 1975?

30 A Yes.

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 whole matter again, wouldn't you think that the -- over
2 the long haul, the most prudent course is to adopt
3 a line like Dr. Barry's, which is lower down, leaves
4 more of the sedge unimpeded, and crosses Shallow Bay
5 at a more southerly point?

6 A If that's the best
7 compromise we can get from the mainland, and the main
8 line, then I would agree.

9 Q But the point I'm getting
10 at is, I take it that you would on balance, prefer
11 Dr. Barry's line to the mainline?

12 A It's a difficult decision
13 to make. I think that I would prefer it marginally, yes.

14 Q Yes. Oh, could I just ask
15 one question, then I think I'll be finished with Dr. Gunn.
16 Dr. Gunn, have you ever seen grass eat-outs?

17 THE COMMISSIONER: Ever seen
18 what?

19 MR. SCOTT:

20 Q Or geese eat-outs? Areas
21 that geese have eaten out of the sedge or the grass?

22 A I think that we've shown
23 pictures of that, on the North Slope, when I was here
24 previously.

25 Q I take it that that is
26 a phenomenon in which the geese basically eat right
27 down to and through the mud, to the roots of whatever
28 grasses are there.

29 A They probe into the mud,
30 yes.

Q And the result of it is

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 to -- is to leave a large area denuded of grass?

2 A It all depends on what you
3 mean by large, but there are certainly extensive areas,
4 yes.

5 Q I've been told that geese,
6 for example, will walk sixty miles in the staging
7 process, to get grass.

8 A I think we're thinking of --

9 Q Or fly.

10 (LAUGHTER)

11 A -- the area west of Hudson
12 Bay.

13 Q No, but are you familiar
14 with that phenomenon?

15 A Well, I'm familiar with
16 the phenomenon that geese are intensive grazers, and
17 if you try to keep them in captivity,,you have great
18 deal of difficulty because if you put them out in
19 pastures, meadows, they clean it up very rapidly, and
20 you've got no grass left for them. They consume a great
21 deal, so that they have to have large expanses of sedges
22 and grasses to feed on, and if you confine them to
23 one area, or if they themselves confine themselves to
24 small areas where they are feeding intensively, you
25 certainly get bare ground, pretty well.

26 Q And when as you do in the
27 autumn of each year, have 300 to 500,000 snowgeese,
28 in a relatively confined area, the prospect for this
29 is very real, isn't it?

30 A What do you mean by relatively

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 confined area?

2 Q Well, for example, you
3 showed us photos yesterday which were photos of 1,800
4 geese, but you told us that there were 325,000 geese in
5 more or less that location in last year.

6 A Yes, I would say last
7 year, they were in a relatively confined area on the
8 delta.

9 Q Yes, and I take it that
10 the prospect then for a grass eat-out is very considerable,
11 when you have that numbers of geese.

12 A Not if you take last year
13 as a very unusual case.

14 Q If that occurs again,
15 there's going to be a very substantial grass eat-out.

16 A I don't know. The grass
17 and sedges come back well, and I think you would have
18 to go and look and do some ground transects in the
19 areas this year, to see what affect last year had on it.

20 Q Well, let me just ask
21 you a question, and perhaps it's better for Mr. Dabbs.
22 If you were planting grass seeds along a pipeline
23 route, before the arrival of the geese in 1975 at
24 Shallow Bay, would you have preferred to plant that
25 grass seed on the sedges where the geese were, or in
26 the range of low willow scrub to the south? You can
27 answer that as a domestic gardener.

28 A I've encountered this
29 question before, and it's speculation on whether the
30 geese will take out the re-vegetation material or not,

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 but we don't have evidence one way or the other, I don't
2 think. You can only speculate on it.

3 Q Are you aware that grass
4 that is fertilized is attractive to geese?

5 A If the grass is fertilized
6 and it's growing in a healthy condition, I have no
7 doubt it's attractive, yes.

8 Q Those are all the questions
9 I have of Dr. Gunn.

10 THE COMMISSIONER: All right,
11 we'll adjourn for coffee.

12 (PROCEEDINGS ADJOURNED)

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 (PROCEEDINGS RESUMED AT 11:30)

2 THE COMMISSIONER: Well, we'll
3 come to order again.

4 MR. SCOTT: Mr. Jakimchuk,
5 I've been advised that portions of the cross-delta
6 route are favored by mink. Have you any information
7 on that score?

8 WITNESS JAKIMCHUK: Well,
9 portions of the entire delta are utilized by mink and
10 I have no reason to believe that mink would not use
11 the cross-delta routing area, either.

12 Q Have you done ^{any} work that
13 illustrates the relative impacts, if any, on mink as
14 between the cross-delta and the circum-delta routes?

15 A No, we have not.

16 Q No. I've also been
17 advised that portions of the cross-delta route are
18 used for reindeer herding. Are you familiar with that?

19 A There are reindeer on
20 Richards Island. Most of the reindeer herding actually,
21 actually to my knowledge, takes place further east
22 than the cross-delta route.

23 Q Are you aware that there
24 is reindeer herding in the areas west of Richards
25 Island?

26 A West of Richards Island?
27 To my knowledge, I didn't think that area was currently
28 being used for that purpose.

29 Q I take it that if that
30 be so, it's not been a factor which you've considered

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1
2 or to which you given any weight in your preferences?

3 A We have commented upon
4 the possibility of interactions with reindeer herding,
5 particularly with respect to the Farson Lake lateral,
6 but it was not considered to be a highly significant
7 factor in the delta itself. For example, I believe
8 there's about a hundred reindeer on Richards Island
9 itself that are considered to be feral reindeer and
10 are not actually part of the major herding activity.

11 Q Well, would it be correct
12 to say then, that insofar as you've made a comparison,
13 it's not a factor that you've taken into account one
14 way or the other?

15 A Because of the manipulation
16 that is done with that population, in other words, it
17 is a semidomesticated herd that is subject to constant
18 human manipulation, it was not an ingredient in our
19 decision dealing with natural mammal populations:

20 Q Dr. -- Oh, Mr. Dabbs
21 is with us now and perhaps I have a question for him.
22 Mr. Dabbs, the -- when would you propose to revegetate
23 the areas immediately adjacent to the Shallow Bay
24 crossing in the first place, and, secondly, the areas
25 on either side of the crossing after the pipeline has
26 been constructed?

27 WITNESS DABBS: The construction
28 plan, as I recall it, is to establish, if ^{you}wish, a base
29 of operations on either side of Shallow Bay or
30 construction pads or whatever you wish to refer to them

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 as. The season prior to actual construction crossing,
2 if at the close of that first season, there were areas
3 associated with that construction pad that would not
4 likely be required in subsequent years, or the degree
5 of utilization would be very low, then we would see
6 that; either that same fall, but more likely, the
7 following spring as the findings of this seeding program
8 in the delta area again confirm that spring is the
9 most suitable time to seed.

10
11 Now, this may result in some
12 disturbance to that seeded area around that construction
13 pad. That's really not serious because we would follow
14 up the succeeding year with a complete seeding of
15 construction pads on either side of Shallow Bay.

16 Q Well, is it safe to
17 assume, then, that you propose to begin revegetating
18 unless there is special circumstances in the spring
19 following the winter construction of the pipeline?

20 A Well, we're talking about
21 two issues, as you identified them. One, the crossing
22 of Shallow Bay in the areas immediately adjacent, that
23 is proposed as summer crossing.

24 Q Yes.

25 A So those areas would be
26 seeded the next spring.

27 Q Yes.

28 A During that winter of
29 construction, we follow that up in the spring as well
30 with seeding of the overland sections.

Q Yes. So that the seeding

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 is going to be done the following spring?

2 A That would be the plan,
3 yes. There may be cause or may be reason to even
4 seed the fall preceding.

5 Q All right. Well now,
6 are you familiar with the phenomena that make fertilized
7 grass somehow apparent and distinctively attractive
8 to geese?

9 A I can certainly believe
10 that because fertilized grass, particularly with
11 reasonable levels of nitrogen is quite often a
12 darker green, a luxuriant green.

13 Q Yes. What do you say
14 about the effects if 1975 should duplicate itself and
15 there should be, let us say, three hundred thousand
16 staging on your freshly planted plots?

17 A The effects, as I've
18 recognized in the past with the identification also
19 of the concentration of caribou possible in the North
20 Slope would be one of a repeated seeding. The effects
21 obviously, because of the grazing nature of geese
22 being somewhat more severe than caribou because of
23 their seeking out and rooting out of the roots and
24 rhizomes, would result to a large degree, the killing
25 of the grass.

26 Q Yes, and I guess it might
27 happen the next season.

28 A Well, what would start to
29 take place here, of course, because of the low wet
30 nature of the terrain is a very rapid invasion of sedges.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1 That's a demonstrable fact and as those begin to
2 dominate, the area becomes less and less distinct.
3 I can well believe that there'll be a need for some
4 considerable amount of maintenance for several seasons.

5 Q Yes.

6 A However, the -- one may
7 also ask the question, the consequences or the serious-
8 ness of such results in a low lying, flat delta plain
9 where the purpose of seeding would be to control
10 erosion. But the erodibility of the material and the
11 consequences of erosion are very small indeed.

12 Q Well, wouldn't you prefer
13 on balance to be doing your revegetating work on the
14 edge of the sedges adjacent to the willow scrub?

15 A I think sir, if you go
16 back to the day before yesterday, though I didn't state
17 it specifically, it can be concluded that I would
18 prefer the route as we refer to it as the Barry route
19 for reasons identified at either the interior or ^{or}
20 southern routes would be easier to revegetate. From
21 an impact point of view, I prefer -- or I find the most
22 southerly least desirable. So, in conclusion, I would
23 find the route proposed by Dr. Barry, a most acceptable
24 compromise.

25 Q Yes. Well now, Dr.
26 McCart, let me just see if I can summarize ; the
27 December 1975 environmental assessment report at page
28 9 shows three major crossings to be constructed in the
29 summer, 12 winter crossings with some winter flow,
30 31 winter crossings with no winter flow, six lakes crossed

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 and 26 large lakes less than a mile from the route
2 between Shingle Point and Tununuk Junction and would
3 that be, as you understand it now?

4 WITNESS MCCART: I think there
5 are five summer crossings for one thing.

6 Q All right and the five,
7 just so we'll have them. I've only got four; the
8 West Channel, Shallow Bay, Reindeer Channel and Langley
9 Channel. Is there another?

10 A East Channel.

11 Q East Channel, sorry.
12 Well now, at page 161 of the same report, you say that:

13 "Major channels serve as feeding and nursery areas
14 as well as migratory routes and potential over-
15 wintering site",
16 and further on that"

17 "West Channel is important and that Shallow Bay
18 and Reindeer Channel are less important."
19 What do you mean precisely by "less important to fish"?
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A In that particular
2 instance we don't feel that there is input, that there
3 are as concentrated migrations in those areas as
4 there are in the other channels.

5 Q Is it then that they are
6 less important because the migrations appear to be
7 less concentrated?

8 A Yes, it's partly that.
9 I think also that Shallow Bay, for instance, we know
10 to be relatively unproductive of benthic fauna.

11 Q Are there any other
12 distinctions between the channels that you would note
13 in rendering one more or less important than the
14 other?

15 A I think that the basic,
16 the most important criteria from our point of view
17 are the populations which inhabit them as feeding
18 areas during the summer. We can get some indication
19 of this by comparing same sample data and collections
20 of rearing fish and things of this sort. We know, for
21 instance, that the East Channel is much more productive
22 of benthic fauna and food for rearing fishes than some
23 of the other channels such as West Channel, and Shallow
24 Bay. That would be important to us.

25 We also know that some of
26 them are important, more important as migratory
27 pathways than others. East Channel is one of the most
28 important migratory pathways for fish, for instance.

29 Q Well, leaving aside
30 migration for the moment, can you rank the channels

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 in order of their importance, and Dr. Fyles has indicated
2 that perhaps we should leave East Channel out because
3 it's not really on this lateral.

4 A No, I don't think I could
5 -- I could say that I think that of the four channels
6 that remain, the least important or the least likely
7 to be affected detrimentally is Shallow Bay; but among
8 the other three, I don't think there's any basis that
9 I could rank them on.

10 Q You couldn't rank the
11 other three in order of importance?

12 A No.

13 Q Well now, what about
14 Langley Channel, it isn't mentioned in the report, and
15 do I take it that it's relatively as important as the
16 East Channel or -- we'll leave out the East Channel --
17 but as Reindeer Channel or as the West Channel? Or is
18 it more important or less important?

19 A Well, I think there's
20 a bit of confusion there. We have called the portion
21 of Langley Channel that we were interested in south
22 Yaya Channel for some reason. The authors of the
23 report did.

24 Q And how does it rank?
25 Does it rank equally important with the West Channel
26 and Reindeer Channel?

27 A It's an important
28 migratory pathway, yes.

29 Q Well now, at page 174
30 you're referring to the fact that the large channels

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 are being used as migratory routes and you say,
2 "Care must be exercised that upstream movements
3 are not impeded by constrictions in flow that
4 form velocity barriers, and that concentrations
5 of fish are not disturbed by blasting. The
6 major migrations occur at a time when sediment
7 loads are in decline, therefore care must be
8 taken to ensure that abnormally heavy sedimenta-
9 tion from construction activity does not occur.
10 The problem would be obviated if construction
11 on major channels were completed before mid-
12 August."

13 Now, does that apply to all the four channels, that
14 statement?

15 A Yes, it's a general
16 statement, except that because we don't -- we have no
17 real evidence of any massive migrations or concentrated
18 migrations through Shallow Bay, and it might not
19 apply there.

20 Q But I take it that
21 with respect to the other three there is no doubt that
22 it was intended to, and does apply to them?

23 A Yes, and it has parti-
24 cular reference to migration times.

25 Q Then on page 3 of your
26 prepared evidence you say:

27 "We have recommended that the movements and
28 distribution of fish should be continuously
29 monitored during the construction period, and
30 if it appears that fish migrations are being

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 affected, there should be modifications in
2 construction procedures to mitigate the problem.
3 These might include short-term shutdowns to
4 permit passage or rescheduling of some potent-
5 ially damaging construction activity such as
6 blasting, so that they occur when fish are
7 dispersed rather than concentrated."

8 And I take it that that statement applies to the three
9 channels.

10 A Yes.

11 Q And I take it that it
12 also applies to Shallow Bay in the event that you find
13 any substantial migration of fishes in Shallow Bay.

14 A Yes.

15 Q Well now, how -- what
16 is this monitoring and how is it to be done?

17 A Well, I think this ques-
18 tion was asked yesterday. What we had in mind is that
19 we would put in a net probably fight net, pound 'net,
20 something of this sort, run a lead out into the
21 stream, and possibly not continuously but we can open
22 the net for a period of time and determine whether in
23 fact there are fish moving past the point. If it
24 appeared worthwhile we could tag some of those fish
25 and we would then release them and determine whether
26 they showed up at a second similar apparatus set up-
27 stream of the crossing.

28 Q Well now, I presume if
29 you put a net in there you're going to catch some
30 fish. What is going to be the standard that will lead

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 you to believe that there is a migration under way?

2 A Well, because normally
3 you see, nets only catch fish which are moving.

4 Q Yes.

5 A You can get recaptures
6 of fish which are somewhat stationary, and you can
7 identify these if you use numbered tags. There are
8 certain species which hang around in an area and might
9 be repeatedly caught, I can easily identify those.

10 The migrations up the Mackenzie
11 River are markedly peaked for most the important
12 species, and you know that there's a migration under
13 way because you get no fish one day and you may get
14 thousands and thousands the following day. Now if you
15 get a parallel peaking of the catches at your two
16 nets, one downstream and one upstream of the area of
17 activity, then you can demonstrate that the migration
18 had in fact proceeded past the point of activity and
19 that you are getting a comparable peak upstream.

20 Q Is it at that point that
21 you will judge that the migration is being effected?

22 A I think that in addition
23 to that we might want to use other fishing methods
24 to determine whether there is a concentration of fish
25 immediately downstream of the area of operation.

26 Q Well, what other methods?

27 A Possibly use seines in
28 some instances, and gill nets in others.

29 Q Well, can I summarize it
30 simply by saying that when you have your nets out and

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 you catch a substantial number of fish, you're going
2 to conclude that a migration is under way. Is that
3 step 1?

4 A That's right, yes.

5 Q And then you are going
6 to do something. What are you going to do? You've got
7 that information. How do you use it?

8 A I don't quite understand
9 the question.

10 Q I take it that the purpose
11 of this is to enable a migration to occur without
12 interference from construction.

13 A Yes.

14 Q Well now, when you catch
15 a reasonable number of fish, indicating a migration
16 is under way, are you then going to stop construction?

17 A No, I would only stop--
18 recommend that construction be stopped if the second
19 net located upstream of the area of disturbance indicated
20 that a peak fish were showing up at the downstream
21 net but were not making it through to the upper one.
22 This would be an indication that the migration was
23 under way but was being held up.

24 Q And it will be in that
25 circumstance that you will recommend that construction
26 be stopped?

27 A Yes. I might point out
28 that I don't think that the species that are migrating
29 up are going to be affected to any great extent by the
30 kind of operation that I envisage.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q Is this a, bearing in mind
2 the rather ad hoc nature of this procedure, is this
3 an effective way to allow migrations to occur unimpeded,
4 or is it rather haphazard?

5 A What, shutting down the
6 activity?

7 Q No, this business of
8 having nets or weirs at either end and taking your
9 catch and measuring the extent of the catch at one
10 end as against the other, and then deciding construction
11 should be stopped?

12 A Well, obviously it would
13 be better if construction did not take place at all
14 during the migration period.

15 Q And I take it, therefore,
16 that you would favor any proposal that allowed winter
17 construction to occur.

18 A Not necessarily. It depends
19 on whether there's any evidence of autumn spawning. I'd
20 be more concerned about sedimentation over spawning
21 beds than I am about the possibility that construction
22 activity is going to impede the upstream migration of
23 fish.

24 Q Do you know whether there
25 are domestic fisheries near any or adjacent to any
26 of these four crossings that could be disturbed by
27 the summer construction?

28 A I understand that there
29 is a fishery on, I think, Reindeer Channel north of
30 the area in which we are operating.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

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Q I'm sorry, do you know

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how far north?

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Webb, Gunn, Dabbs, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A Yes, it's at Big Eddy, I'm
2 not certain how far that is. There is a domestic
3 fishery occasionally at Yaya Lake, which is actually
4 upstream of the --

5 Q Well now with respect
6 to these four channels, can you, dealing with each
7 of them, tell me whether you would prefer a winter
8 crossing, if that were feasible in engineering terms,
9 and if not, why not?

10 A I suspect that West Channel
11 is an overwintering area for fish. It's difficult
12 to say how many fish are in there. We have caught
13 them on occasion -- or let's put it this way, we
14 suspect that there's sufficient flow there to harbour
15 overwintering fish. There's no evidence of any
16 spawning in the vicinity, and I think that I would
17 not be adverse to a winter crossing as opposed to a
18 summer one in the area. As far as Shallow Bay, I
19 feel that from the point of view of fish, it probably
20 doesn't make very much difference whether it's a
21 summer or a winter crossing.

22 Q How about the other two?

23 A Middle Channel apparently
24 has winter flow, Reindeer Channel, and again I doubt
25 that with the amount of water available, and the
26 potential for dispersion in the channel, whether
27 overwintering fish can be very much affected, so
28 again, from my point of view, a winter crossing
29 doesn't disturb me. As to whether it's preferable
30 to a summer one, I don't think I'd like to say at

Webb, Gunn, Dabbs, McCart,
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1 the moment.

2 Q Well I take it that -- is
3 it your position with respect to those two channels
4 that you don't care whether it's crossed in winter
5 or in summer. Is it a matter of indifference to you?

6 A In the sense that I'm
7 mostly concerned about -- if we're concerned about
8 spawning, most of the spring spawning will have been
9 completed and the hatching will have taken place, before
10 summer construction would start. In none of these
11 instances do we have any evidence of fall spawning --
12 excuse me -- in these channels, at least in the vicinity
13 of the pipeline crossings. There is a problem in the
14 winter with overwintering fish, but there's sufficient
15 volume of water in these channels that these fish can
16 in fact move out of the immediate vicinity. They're
17 not confined to a very small critical area such as
18 fish along the North Slope, in the vicinity of ground
19 water sources.

20 Q How did you determine
21 whether there were spawning areas there or not?

22 A We haven't found -- we
23 have netted many of these channels, and we have not
24 yet found any evidence of ripe fish in the vicinity
25 of these channels. I'm speaking of fall spawning
26 species now. I might point out that no one else has
27 any definitive data which indicate that fall
28 spawning species actually spawn anywhere in the
29 vicinity of these crossings.

30 Q Well now let's deal with

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1 winter crossings with winter flow, and on page 162 of
2 the environmental assessment of December '75, concern
3 is expressed over interference with overwintering fish,
4 of channels such as Moose Channel, and the outlet to
5 Yaya Lake, where winter construction is planned, and
6 where there appear to be populations of overwintering
7 fish, and on page 174, these words appear,

8 "These locations will receive further site specific
9 investigation, particularly winter studies, and
10 appropriate mitigative measures, including timing
11 and construction techniques, will be defined."

12 Now there you were talking about the Moose Channel and
13 the outlet of Yaya Lake. Does that statement apply
14 as well to the other ten or twelve channels that have
15 been isolated, that meet this characteristic?

16 A We have, of course, done
17 some winter work, but we have recommended to Arctic
18 Gas that if this route is in fact going to be utilized,
19 there should be additional work, yes.

20 Q Well, would I be correct
21 in assuming that the work you contemplate in that
22 paragraph, will be done, if it has not already been
23 done, with respect to each of the twelve channels, or
24 crossing?

25 A Twelve winter crossings?

26 Q Yes.

27 A Yes. We would suggest that
28 that be done.

29 Q Well now, what exactly
30 is contemplated by that? You say that these locations

Webb, Gunn, Dabbs, McCart,
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1 will receive further site specific investigation,
2 particularly winter studies. Now what investigation
3 is contemplated?

4 A Well, we would contemplate
5 going back into these areas in late summer, early fall,
6 just prior to freeze-up, to determine whether there
7 are concentration -- any deep holes downstream, any
8 concentrations of fish that we locate, in those areas
9 where there's evidence of concentrations of fish
10 where overwintering might be taking place, we would
11 then go back after the ice got firm enough, net these
12 there to determine whether they're still there. If
13 they are still there, then we might suggest modification
14 in the route, if the route in fact is close enough
15 to affect these fish populations.

16 Q And this I take it is a
17 site specific investigation that you propose to do in
18 the late autumn or early winter, immediately preceding
19 construction.

20 A Well, hopefully we would
21 have a little more time than immediately preceding
22 construction.

23 Q Well, it would be done
24 that season, of course, rather than some --

25 A No, I think we would
26 prefer to do it if we can, a winter prior to the onset
27 of construction in that particular area.

28 Q Well is that -- is information
29 obtained the winter prior to likely to be necessarily
30 significant in the winter of construction?

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1 A Yes, I think that fish
2 tend to be a little more regular in their habits, as
3 far as overwintering areas, than snowgeese in their
4 feeding. In other words, if it's a suitable overwintering
5 area, and we find that there are fish in it in the
6 winter of 1977, we have to proceed on the presumption
7 that it will also be used in the winter of 1978.

8 Q And have you received
9 at
10 any assurances as to whether ^{at} that stage, rerouting
11 of the line will be either possible or permitted?

12 A We haven't received any
13 definite assurance. Certainly that's our recommendation,
14 that this should be done.

15 Q Well, do you have any
16 fear that by leaving it to that time frame, it will be
17 exceedingly difficult to introduce route modifications
18 to meet your concerns?

19 A We're not talking about --
20 I don't think that we have to be concerned about
21 major modifications in a route. That may in fact be
22 the case. But I think in most instances we're talking
23 about a hole which has a definite location, and that
24 serious disruption can possibly be avoided by a small
25 move, either upstream or downstream.

26 Q Well, what do you mean
27 in that statement when you say you'll be looking for
28 interference with overwintering?

29 A Could you read the
30 statement again?

 Q Yes. On page 174, do you

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1 have that in front of you? Actually there's one
2 reference to it on page 162, where you say "interference
3 with overwintering, is more likely in the case of
4 moderately sized channels, such as Moose Channel and
5 the outlet to Yaya Lake, where winter construction is
6 planned and where there are populations of overwintering
7 fish," and I just wondered what you envisaged by
8 interference with overwintering?

9 A What kinds of interference?
10 Blasting in an area could of course affect the fish,
11 as it would interfere with their overwintering. There's
12 a possibility I suppose that extremely heavy sedimentation
13 might. If there are other stresses on the fish, in
14 late winter, low oxygen conditions, conditions which
15 I should point out we have not found in these channels,
16 that an additional stress from sedimentation might
17 cause mortalities.

18 Q And in addition to those
19 is a pipe passage right over the overwintering area,
20 of course.

21 A Well, through an overwintering
22 area, yes.

23 Q Well, confronted with
24 one of those possibilities, what are the kinds of
25 mitigative measures you contemplate?

26 A Well, if we can define
27 it as a fairly circumscribe area -- I'm most concerned
28 about in a situation in which fish would be confined
29 to a rather circumscribed area. In most of these
30 channels there's a large amount of winter flow, and

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1 fish have the opportunity to move out of the area of
2 greatest disturbance, if they so chose. They are
3 certainly aware of noxious stimuli, and fish in natural
4 situations can often avoid circumstances that they
5 don't like. We would be concerned if we found a pocket
6 in a river in which fish were overwintering, and a
7 situation in which they did not have the opportunity
8 to move out. Now this is the sort of situation that
9 we have described for North Slope streams, and I
10 don't think it happens very often in the delta. It
11 may never happen in the delta; but if it does, this
12 is the kind of situation we'd be looking for.

13 Q Well, when you find that
14 situation, what are your mitigative measures going to
15 be?

16 A The most obvious one is
17 to move the pipeline.

18 Q Any others?

19 A To do it as early in the
20 fall as possible, because in the early portion of the
21 fall you have a greater volume of water, and the
22 opportunities for the fish to avoid detrimental
23 circumstances are greater.

24 Q Well, bearing in mind
25 these crossings are fixed for winter construction,
26 as I understand it --

27 A Yes.

28 Q -- what do you mean by
29 doing it as early in the fall as possible?

30 A Well, to me fall extends

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1 up into November. This may not be the truth -- may not
2 be true in the north, obviously. Winter comes earlier.
3 But as soon as it's possible to move equipment into
4 the area, one would undertake operations then.

5 Q All right. Those are
6 two measures. Are there any other measures when
7 you find circumscribed populations of fish, of the type
8 you've identified?
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1 A A fair measure would be
2 to ensure that the time spent operating in the channel
3 itself is as short as possible. I think this is
4 extremely important. The fish might be able to
5 tolerate two days of sedimentation in disturbance,
6 where they might not be able tolerate repeated distur-
7 bances over a period of time. We've made this
8 recommendation.

9 Q Well now, what, if any
10 are your concerns related to small streams with no
11 winter flow, of which there are some 31 in the area
12 under discussion?

13 A Does this area under
14 discussion, incidentally, include the Travaillant Lake
15 segment, or is this simply the portion from Tununuk
16 Junction to the West Bank?

17 Q From Tununuk Junction,
18 not the other part.

19 A I'm not very much concerned
20 about those particular streams.

21 Q Well, have you any concerns
22 about them?

23 A I think that the standard
24 procedure should ensure that there is no flooding back
25 up the right-of-way from these things. It's difficult
26 to get terribly concerned about sedimentation in the
27 delta because of the heavy sediment loads which occur
28 naturally there.

29 Q Well now, let's turn
30 to lakes which is the next category and at page three

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1 of your transcribed evidence, you refer to the
2 possibility of reduced productivity on clear lakes
3 subjected to increased sediment loads and you recommend
4 lower down on the page:

5 "avoidance of lakes by a wide margin and special
6 studies of one clear lake that is crossed by ^{the} route."
7 Now first of all, can you tell us how many such lakes
8 there are in this category on the portion of the route
9 under discussion?

10 A That are clear lakes?

11 Q Lakes that require, as
12 you put it, "avoidance by a wide margin and special
13 studies".

14 A That should probably
15 read, "by as wide a margin as possible".

16 Q Either name the lakes
17 or point them out on the map.

18 A Some of them are rather
19 small. I can refer to them by the names, station
20 numbers that we have given in our report. That might
21 be the best way.

22 Q Thank you.

23 A Station three, a small
24 lake there which is a clear lake. It's adjacent to station 2
25 which is one of the turbid ones. Just immediately
26 south of station three, there is another one which is
27 a clear lake which we might be concerned about. The
28 line passes between the two of them. Immediately
29 north of the channel which joins Moose Channel which
30 is at least, apparently locally, called Bennett Channel.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
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1 There are several small, clear ponds. Station eight
2 is a small -- sorry, is a clear lake. We have recommend-
3 ed to Arctic Gas that the line be moved north as far
4 as possible to avoid interference with this lake.

5 Q Stopping right there,
6 are you satisfied with the present location of the line
7 with reference to that lake?

8 A No. As I say, we have
9 recommended that it be moved as far away from that
10 lake as possible. The difficulty is that in that
11 area, the pipeline passes between two lakes which
12 are only approximately four or five hundred yards apart,
13 one of which is turbid and one of which is clear.

14 We have suggested that the
15 best move in that particular instance would be to move
16 the line north away from the clear lake and closer to
17 the vicinity of the turbid one.

18 Q Yes.

19 A But at this point, it
20 lies closer to the clear lake than it does to the
21 turbid --

22 Q Yes.

23 A And we would like to
24 see that reversed.

25 Q All right. Go on please.

26 A There are several
27 clear lakes immediately to the west of Middle Channel.
28 While we've not made a recommendation, it may be
29 possible -- it's difficult for me to tell from my
30 alignment sheet whether it passes through one or through

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
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1 an area of sedge adjacent to it.

2 Q If it passes through
3 one, you'd want it moved, would you?

4 A We'd prefer not to see
5 the alignment pass through lakes if at all possible.
6 In the vicinity of the old site of compressor station
7 CD-08, there are several clear lakes in that vicinity.

8 Q That's where they're
9 going to put the statue of Dr. Gunn who got it moved?

10 A Yes. Incidentally, we
11 did in fact, make a recommendation regarding that at
12 some point in the past.

13 Q You weren't as effective
14 as Dr. Gunn?

15 A Well, we wanted it moved,
16 but we didn't suggest moving it as far as it has been
17 moved. There are several small ponds, probably
18 not fish ponds, immediately to the east of site 28.

19 Q Are you concerned about
20 them, or do they require investigation?

21 A I think that they're not
22 fish ponds from the size of them. We have no data
23 on them, but they look of insufficient size to support
24 a fish population. I think they're probably too
25 shallow. We are concerned about this lake which lies
26 adjacent to site 32. There are two lakes there, one
27 is the long, thin lake that we recommended special studies
28 on. We also looked at the lake which lies to the east
29 of it.

30 As I pointed out, I think,

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1 yesterday, we did in fact go back there this spring
2 and we have looked at that lake and find there is less
3 than a foot of water at the pipeline crossing. However,
4 we would recommend that it should be looked at again
5 during the early fall to determine whether there's any
6 possibility that spawning has taken place.

7 Q Yes.

8 A We're not, in fact,
9 certain at this point whether there are fish in the
10 lake.

11 Q Are there further lakes
12 to add to your list?

13 A There is a series of
14 clear lakes between Grassy Lake and the Yaya River
15 and we have indicated that these lakes need further
16 study. Some of these are -- look as if they might
17 have fish populations and they are clear lakes. That's
18 the list.

19 Q Well now, Dr. McCart,
20 you've also said on page 161, 162 that:

21 "The shallow turbid ^{lakes} near the route can be important
22 nursery and feeding areas for fish during the
23 summer, but it is likely that most are unsuitable
24 for overwintering."

25 Is this a general conclusion from your knowledge or
26 do you know anything about overwintering in those
27 particular lakes?

28 A No, we have some informa-
29 tion on overwintering in some of them.

30 Q Yes, and there is over-

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
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1 wintering in some of them?

2 A Yes, there is overwintering
3 in some of them.

4 Q Is it a function of
5 water depth?

6 A Primarily, yes. A lot
7 of these, of course, are just old channels, abandoned
8 channels and they're of insufficient depth or insuffi-
9 cient residual volume to support fish populations, we
10 feel.

11 Q Well now, isn't the
12 problem here in order to get a route through the
13 delta, one of tradeoffs being made to reduce the impact
14 on the one hand of clear lakes and then the impact on
15 the other of turbid lakes that may have importance?

16 A To some extent, that's
17 true. I --

18 Q -- I'm sorry.

19 A I should point out that
20 in a lot of instances, we have made recommendations
21 concerning lakes whose drainages are not really going
22 to be affected as far as we can see by the pipeline.
23 They're adjacent to it. We've indicated our concern,
24 but hopefully, if appropriate measures are taken to
25 stabilize the pipeline in the vicinity of these clear
26 lakes, we are not crossing inlets to them. They are
27 totally isolated without stream connections that it
28 should be possible to maintain their clarity.

29 Q Yes, but because of the
30

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Jakimchuk, Rowe,
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1 necessity to make tradeoffs, I take it that it's inevitable
2 that there will be impacts on some lakes?

3 A Well, there'd definitely
4 be impacts on lakes that are crossed as one class,
5 and there are some lakes that will be crossed by the
6 pipeline in this area.

7 Q It is at least within
8 the realm of possibility, bearing in mind construction
9 techniques, that there will be impacts on lakes that
10 are not crossed?

11 A It's possible, yes.

12 Q Well now, apart from
13 avoidance, what are the techniques that you have
14 recommended to prevent or reduce these impacts?

15 A I think I indicate in
16 my evidence that our -- that in general, we would
17 recommend the same sorts of procedures that we would
18 recommend anywhere. These include erosion control,
19 specific attention to conditions, particularly the
20 first spring after construction has taken place and
21 if there's some evidence of sedimentation occurring
22 in an area where it's inappropriate, such as a clear
23 lake, we ^{would} hope that the pipeline company would undertake
24 to repair this as fast as possible.

25 We would make the same sorts
26 of recommendations we've made regarding fishing, things
27 of this sort, for other areas along the route.

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 Also we certainly want control
2 of any kind of camp facilities so that we didn't get
3 a pollution, sewage pollution, control of fuel depots,
4 fertilizers, all of these things.

5 Q And I take it that among
6 the major sources of adverse impact will be the
7 possibility of an oil spill.

8 A Well, I think I'd call
9 it a fuel spill.

10 Q All right, a fuel spill.
11 Are you familiar with Arctic Gas' plans, contingency
12 plans with respect to that?

13 A In a very general way,
14 yes.

15 Q Well, have you had the
16 advantage that we have? Have you seen them?

17 A No, other than the fact
18 that I have seen that they will have them and that
19 they are in the process of being formulated at the
20 moment.

21 Q I take it that your
22 review of those plans is a significantly important
23 piece of work that lies ahead of you.

24 A I expect that we will
25 be asked to review them, yes.

26 Q And that has not yet
27 been done?

28 A No.

29 Q Well now, let me just
30 take you to the Barry route and I understood you to

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Jakimchuk, Rowe
Cross-Exam by Scott

1 say that you may have been mistaken, that one of the
2 distinguishing features, as far as you're concerned,
3 about the Barry route is that it involves more crossings.
4 Is that in fact correct?

5 A I don't know if it's
6 correct, but I said that I may have. I think that -- I
7 thought that I said that it involves more water bodies,
8 and not specifically crossings. I haven't counted the
9 number of crossings on the thing. A glance at the
10 map suggests to me that there are more lakes in the
11 vicinity of the Barry route than there are, for instance,
12 in the vicinity of the prime route.

13 Q Well, perhaps I could just
14 trouble you over lunch to count and compare the
15 crossings of either lakes or rivers, leaving aside the
16 major channels that we'll come to in a moment, to see
17 how it compares with the prime route, because I suggest
18 to you that that will be a significant factor in
19 deciding in your mind whether one route or the other
20 is preferable.

21 A Well, we would certainly
22 take into account the number of crossings. I note that
23 the crossings on the Barry route are rather wider than
24 the ones on the other route.

25 Q You're speaking of the
26 Swimming --

27 A Well, I'm speaking of
28 the Shallow Bay crossing and of the Reindeer Channel
29 crossing.

30 Q All right.

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Jakimchuk, Rowe
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1 A And this, of course, is
2 another significant factor.

3 Q Well, let me deal with
4 that significant factor. First of all, you will see
5 on the red route at the top the Reindeer crossing in
6 sort of a box. Do you see that?

7 A Yes.

8 Q Yes, and that's a double
9 crossing.

10 A Yes.

11 Q And are you aware that
12 that crossing has a drop of about 70 feet and is
13 regarded by the engineers as a very difficult crossing?

14 A I think Mr. Williams
15 has indicated that.

16 Q Yes. Are you aware that
17 the alternative crossing on the Barry route, while
18 wider, is in fact a shallow plate-like crossing?

19 A No, I must admit that
20 I have not had the opportunity to discuss the Barry
21 route with anyone in any detail as to its --

22 Q You would agree with
23 me that the question of whether a wider crossing is
24 an easier one is one that will be determined by factors
25 other than, or in addition to its mere width.

26 A Yes.

27 Q And therefore you are
28 in no position to say that the Reindeer crossing
29 on the selected route is easier or harder than the
30 Reindeer crossing on the Barry route.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
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1 A That's correct, I wouldn't
2 say that.

3 Q And you wouldn't disagree
4 at the present time with Dr. Barry's evidence if it
5 were led that you'd been told by Arctic Gas that his
6 Reindeer crossing was easier.

7 MR. MARSHALL: I beg your
8 pardon, Mr. Scott? Do you want to withdraw that
9 statement?

10 MR. SCOTT: You have no
11 reason to disagree with that.

12 MR. MARSHALL: I mean in
13 that you've got about six hypotheses.

14 MR. SCOTT: All right. Our
15 information is that Mr. Williams told Dr. Barry that
16 in fact the Reindeer crossing on the Barry route is
17 preferred to the Reindeer crossing on the prime route
18 because of its shape from an engineering point of view,
19 even though it's longer.

20 A Well, that may very well
21 be true, I don't know.

22 Q And if that were so, you
23 wouldn't have any complaint about that crossing being
24 used rather than the crossing shown on the prime route.

25 A None.

26 Q No. Well now, if we
27 come to the Shallow Bay crossing, I'm telling you --
28 and there may be evidence about it -- that Arctic Gas
29 has indicated that it is possible if either Dr. Barry's
30 route is used or indeed one any further down, across

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Cross-Exam by Scott

1 Shallow Bay in the winter. Now take that as given. I
2 take it that you are not therefore in a position to
3 say that the Barry Shallow Bay crossing is better or
4 worse than the prime route?

5 A No, as I pointed out
6 yesterday, we have not examined fisheries distribution,
7 the distribution of fishes or any other aspects of
8 the aquatic ecology of the Barry route. Neither,
9 should I point out, has anyone else, so there really
10 are no data available on it yet.

11 Q So that apart from the
12 count of crossings and adjacent water bodies or lakes,
13 and whatever that count may reveal, you're in no
14 position to say, as I understand your evidence, whether
15 the Barry route is as good from a fish point of view
16 or better.

17 A No, I think that's what
18 I stated yesterday, that I'm not in a position to assess
19 the Barry route with respect to fisheries. I did point
20 out one possible problem, and that is that it does
21 cross Moose Channel or West Channel in the vicinity of
22 the Big Fish River outlet, but this may not in fact
23 be a problem. We would have to examine it to find out.

24 Q Well now, apart from the
25 minor modifications that you've already described to us,
26 relating to the -- your desire to have the prime
27 route pass further away from certain clear lakes, are
28 there any other modifications in the prime route that
29 you harbor in your mind?
30

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1 A Well, I think have one
2 of the same concerns that Mr. Jakimchuk has. If possible
3 I would like to see lake crossings totally eliminated.

4 Q Anything else?

5 A Nothing that I can think
6 of offhand. We have made, of course, site specific
7 recommendations which are in many cases related to this
8 problem of clear versus turbid lakes and related to the
9 problem of lake crossings.

10 Q Well now, Dr. McCart,
11 let's come to a comparison between the cross-delta
12 route and the circum-delta route. As I read your
13 evidence, you haven't made a comparison per se in your
14 printed statement, but I note that Mr. Hemstock has.
15 He says on page 4 of his evidence that,

16 "On an overall basis we believe that the impact
17 on fisheries with the cross-delta routing will
18 be about the same as the original prime route
19 or possibly slightly less."

20 Now, do you agree with that?

21 A I think my own feeling
22 is that I think that it is feasible to cross the delta
23 and that the probable impacts are not going to be
24 very much different from the impacts on the circum-
25 delta route. I wouldn't say possibly slightly less,
26 I'd say that it's impossible on the basis of the data
27 we now have to make a comparison on that basis.

28 Q Well, would it --

29 A Let me go back. It's not
30 possible to distinguish between them. There are

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1 advantages to one and disadvantages which are balanced
2 as far as we can see by the advantages and disadvantages
3 on the other.

4 Q So that I can have a
5 kind of check list, can you give for me the advantages
6 of one over the other?

7 A I can list them in a
8 general way.

9 Q Could you do that?

10 A The cross-delta route
11 as far as we can see from the information available
12 to us, avoids more of the domestic fishing sites which
13 are being actively used.

14 Q Yes.

15 A That's one advantage.
16 Of course it is much shorter and there are fewer cross-
17 ings involved. More major crossings, if I'm not mis-
18 taken, but fewer minor stream crossings on the cross-
19 delta route as opposed to the other one. There are
20 more lakes on the cross-delta route. The lakes that
21 are in our assessment of lakes and ponds, we distin-
22 guish between large ones and small ones. A lot of the
23 small ones that we record as being in the vicinity of
24 the cross-delta route are in fact probably without
25 fish, although they may be important to other species
26 such as the birds.

27 The cross-delta route eliminates
28 the necessity for putting a berm in the East Channel,
29 which is probably a plus in favor of the cross-delta
30 route. It places the line, if I'm not mistaken,

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1 somewhat further away from Holman's Creek, which we
2 suspect might be a migratory pathway for certain
3 species of fish.

4 As far as the area to the
5 south in the vicinity of Travaillant Lake, we have
6 examined the cross-delta routing and from our point
7 of view it doesn't appear to be very different in
8 terms of its potential impact from the original routing
9 to the west.

10 Q Well what then are the
11 advantages in favor of the circum-delta route or the
12 negatives on the cross-delta route that balance out?

13 A I think the major advan-
14 tages of the circum-delta route is that there are
15 fewer channel crossings, major channel crossings.

16 Q Are there any other
17 advantages?

18 A There is --

19 Q Are there fewer lakes?

20 A -- fewer lakes, fewer
21 lakes, yes, in total.

22 Q Are you able to compare
23 the number of crossings on either route that have
24 winter flow?

25 A We could. I don't have
26 those data but we could do that.

27 Q Are there any other
28 factors that you put into play in trying to make this
29 equation?

30 A I think that one factor

Webb, Dabbs, Gunn, McCart
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Cross-exam by Scott

1 that we have considered is the fact that in the outer
2 delta there is a large volume of water available to
3 fish in which they can move during the course of the
4 winter and that they tend to be much more dispersed
5 and less concentrated than they would be in major
6 ⁱⁿ tributaries/upstream tributaries such as the Peel
7 River.

8 Therefore the likelihood that
9 you're going to damage an individual population of
10 fish that utilizes a particular area such as the Peel
11 River as a spawning ground is less in the delta where
12 they're co-mingled with other populations than it is
13 if you were to have some unfortunate occurrence on the
14 Peel River itself.

15 Q And I take it that you'd
16 also put into that equation the statement in the
17 original cross-delta route application which reads
18 as follows, Section 4.7:

19 "The Mackenzie Delta is probably the most
20 important fisheries area along the entire
21 pipeline route. Fish utilization of the
22 area is extensive and the delta serves as
23 spawning, rearing, overwintering and also as
24 a migratory pathway for many species."

25 A Yes.

26 Q Well now, if it were
27 stipulated that an oil pipeline would follow the
28 route selected, are you in any position to determine
29 whether that would alter your view of which route is
30 preferred?

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Cross-Exam by Scott

1 A I think it probably would,
2 yes.

3 Q Can you give us your
4 view as to the effect of how it would alter it?

5 A I would be very reticent
6 about a proposal to put an oil pipeline across the
7 delta. The major transportation medium for spilled
8 oil is in fact water, and that with the volumes of
9 water passing through the delta, the likelihood that
10 you'd be able to control it is decreased, it seems to me.
11 I would prefer to see it to the west so that if an
12 oil spill did occur it might be possible to control
13 it before it got down into the major portion of the
14 delta itself.

15 Q Well now, let me ask you
16 one other question, Dr. McCart. One only -- as I
17 understand it, one only has to consider these routes
18 across the delta and circum-delta in the event that
19 the Yukon coast route is selected from Alaska.

20 A Yes.

21 Q Now, if it were stipulated
22 -- I say "if" and I ask you to take this as given --
23 that an oil pipeline would follow the route that is
24 selected for a gas pipeline, what do you then say about
25 your preference as between the Yukon coast and delta,
26 versus the interior route?

27 A As I pointed out, I think
28 earlier, our preference for the interior route -- or
29 excuse me, the coastal route is based on the situation
30 in Alaska, and not in Canada at all, that with respect

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 to the coastal and the interior route in Canada, we
2 don't really have a preference.

3 THE COMMISSIONER: Your concern
4 relates to the char in the Canning River?

5 A Relates to the Canning
6 River, exactly, it's an extremely narrow passage there
7 and we felt that the Arctic char populations were
8 more likely to be detrimentally affected if the
9 interior route were chosen.

10 With respect to an oil
11 pipeline I'd have to think about it, I think.
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 MR. SCOTT: If that stipulation
2 that an oil pipeline would follow the route, were put
3 into the equation, is that likely to alter your view
4 as to whether the coastal route or the interior route
5 is preferred?

6 A It might, yes.

7 Q What would be required
8 to determine whether it would?

9 A You'd have to have information
10 on the particular construction techniques that were to
11 be used. If the pipeline were to be constructed in
12 the manner that the Alyeska one has been constructed,
13 with a permanent road, I would be adverse to having
14 a pipeline then across the North Slope. If it were
15 possible to build it without the use of a permanent
16 road, using an ice road or a winter road, I think that
17 this would reduce my objections to an oil pipeline
18 across the coast.

19 Q In addition to the
20 question of a road, however, isn't it the possibility
21 of an oil spill that is a dominant factor in one's
22 reservations about an oil pipeline?

23 A That and the fact that
24 the oil pipeline -- there are geotechnical considerations,
25 it seems to me. If it's to be a buried oil pipeline,
26 as opposed to an elevated one, I think that there's
27 the problem of erosion potential and this is extremely
28 important to fisheries biologists. We would have to
29 know something about that.

30 Q Well, let us assume that

1 those geotechnical considerations were met. I put it
2 to you that if an oil pipeline were following the
3 stipulated route, and the risk of oilspill continued
4 to exist, that that would be a factor that would lead
5 you to reconsider your preference for the Yukon coastal
6 route?

7 A Yes, we would reconsider.
8 One of the difficulties of course in going the interior
9 route that you enter the Porcupine-Yukon drainage, and
10 a spill occurring anywhere in those drainages might
11 contaminate a large part of the -- of a major river
12 system. It may be possible, more easily controlled
13 in an individual stream along the North Slope, We'd
14 have to put that into the balance, it seems to me.

15 Q But I take it that if
16 that stipulation is made, or is relevant, your expressed
17 preferences would have to be reconsidered?

18 A Yes, right.

19 Q Now I'll be about 25
20 minutes more, and I've asked Dr. McCart to do some
21 counting. Would this be a convenient time to break?

22 A Excuse me, I was supposed
23 to count just river channels, is that right?

24 Q I'd like you to count and
25 compare river crossings and lakes, on the prime cross
26 delta route, and the Barry alternative, so you only
27 have to count the area where they --

28 A Did you already have those
29 data?

30 Q I'm sorry, I don't, in

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 as accurate form as you're going to get them for me.

2 MR. MARSHALL: Do you pay
3 double consultant fees over the noon hour?

4 THE COMMISSIONER: All right.
5 We'll adjourn till 2:00 then.

6 (PROCEEDINGS ADJOURNED AT 12:35 P.M.)
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Webb, Dabbs, Gunn, McCart
 Jakinchuk, Rowe
 Cross-Exam by Scott

(PROCEEDINGS RESUMED AT 2 P.M.)

MR. SCOTT: Mr. Commissioner,

I'm in the middle of my cross-examination. I would propose to examine Mr. Hemstock and Professor Banfield separately in view of the fact that the other participants have not cross-examined either of them. If they wish to sit on the panel, I of course have no objection to that. But I don't propose to conduct my cross-examination of their papers until the other participants have done so. I have indicated that to Mr. Marshall and I presume that he and they will respect that.

MR. MARSHALL: Well, I assume when Mr. Scott is finished this round of his cross-examination the other counsel could then carry on and Mr. Scott could follow them, if he chooses to do that.

THE COMMISSIONER: Yes, all right.

MR. SCOTT: There's one other question, Mr. Commissioner. My friend, Mr. Marshall, indicated some time ago that it would not be possible for Dr. Banfield or Mr. Hemstock to be here early in the week, and as a consequence we went to some difficulty to get a witness to be here. I am most anxious that his evidence should be heard, as he's come here in effect out of turn and has waited to fill this gap, which my friend anticipated might occur. To ensure that all three persons are heard, I would propose that we should sit tomorrow and tomorrow evening, if

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 necessary, until completed, if there's any difficulty
2 about it, because I would be embarrassed to ask Dr.
3 Sprague to return unheard, he having come here to fill
4 this gap, and I would of course be embarrassed if Dr.
5 Banfield or Mr. Hemstock weren't heard.

6 THE COMMISSIONER: Well, I
7 thought we were sitting this evening.

8 MR. SCOTT: Well, the reporters
9 have apparently indicated that they don't want to sit
10 this evening, they've been working very hard.

11 THE COMMISSIONER: Well, we
12 could -- it seems to me we could still -- what have
13 we got left here? You're almost finished, I gather.

14 MR. SCOTT: Yes, and I had
15 intended to call Dr. Sprague to give evidence next
16 because we brought him here to fill a gap that we
17 understood resulted from the fact that Mr. Hemstock
18 and Dr. Banfield were going to be in Washington until
19 Thursday or Friday, and he's been waiting at my '
20 request to give his evidence, and I'm anxious to have
21 him heard and let him go back to his university.

22 MR. MARSHALL: Sir, I don't
23 think there should be a great problem in view of the
24 fairly extensive cross-examination there's already been
25 of the panel. Unless some of the counsel feel they
26 will have quite extensive questioning for Mr. Hemstock
27 or Mr. Banfield, I would have thought we would have
28 been able to finish this panel this afternoon.

29 THE COMMISSIONER: Well, let's
30 do this. No one wants to sit in the evening, but if

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 we have to sit in the evening I'd rather sit tonight
2 than tomorrow night, and let's just carry on, and at
3 coffee time counsel can decide whether they feel they
4 should have a night sitting tonight. I really can't
5 see that there's that much to be asked of Mr. Hemstock
6 and Dr. Banfield, and I think if we move along we'll
7 be all right. But at coffee let's decide then whether
8 we'll sit tonight. If the reporters can't be here,
9 they can't be here.

10 MR. SCOTT: The only reserva-
11 tion I have, and it's up to Mr. Marshall, of course,
12 is that Mr. Hemstock and Dr. Banfield haven't presumably
13 read today's evidence. They were here for part of it,
14 and I presume they have already absorbed the evidence
15 read yesterday, and I'm not sure that it's possible
16 to ask them to comment on it if they haven't seen it.

17 However, we will have to
18 deal with that as we come to it, I suppose, I'll just leave
19 it there.

20 MR. MARSHALL: I had undertaken
21 to file a report by Mr. Sidey. I now have that, sir,
22 and I'll file that as an exhibit. I have copies for
23 the other counsel. As well, Mr. Rowe, I believe, had
24 referred to the question that were asked about the
25 flying regulations Arctic Gas^{had} within its corporation.
26 I don't believe that was filed as an exhibit. We have
27 that for filing and I propose to file it and distribute
copies to counsel.

28 (REPORT ON PIPELINE NOISE STUDY BY P. SIDEY
29 MARKED EXHIBIT 512)

30 (FLYING RULES & REGULATIONS, CANADIAN ARCTIC
GAS, MARKED EXHIBIT 513)

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Jakimchuk, Rowe
Cross-Exam by Scott

1 THE COMMISSIONER: Excuse me,
2 proceed, Mr. Scott.

3 MR. SCOTT: Q Dr. McCart, have
4 you been
5 able to do the count that I burdened you with at lunch?

6 WITNESS McCART: Yes, I have
7 done the count.

8 Q Can you give us the
9 results?

10 A This count, of course,
11 is based on this map up here and it's not entirely
12 accurate, I'm sure because there are certain water
13 bodies which are underneath that line which I understand
14 is approximately 1,000 feet wide, as presented on here.

15 Now I found that there were
16 a total of approximately 79 water bodies along the
17 prime route, and a total of 70 along the Barry route.
18 So that my initial perception of the numbers along the
19 two routes was in error.

20 Q Tell me this, when you
21 say "water bodies" are those water bodies crossed?

22 A In the way I did this,
23 these would be minor drainages, major drainages, or
24 major channels crossed and also any lake which was
25 either underneath the line or touched the line that
26 is shown on the map.

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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

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Q I see. Thank you.

A I might add that the Barry route of course has not been planned out in great detail and if you were to move it a quarter of an inch either way, you might find that ^{the} numbers vary considerably as far as lakes goes.

Q Yes, that applies to all routes, doesn't it?

A Well, more so to the Barry route, I would think.

Q Why? Why?

A Well, because we have alignment sheets for the prime route.

Q I see.

A But we have of course, no alignment sheet for the Barry route.

Q I see. Well, I guess that gives us an advantage, it can be moved --

A It's more flexible, yes.

Q -- a quarter of an inch one way or the other. Well now, I'd like to ask of Dr. McCart, Mr. Jakimchuk and Dr. Gunn some questions about the -- I can never pronounce this word -- the Niglintgak supply line and I'm going to call it the Nig supply line, if you'll permit, which of course is the ten mile long recent addition to the pipeline as contained in the January 30th filing.

As I understand it, and correct me if I'm wrong, that this line is slated for construction

Webb, Dabbs, Gunn, McCart,
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Cross-Exam by Scott

1 in the winter except for the crossing of the Kumak
2 Channel which is to be built in the summer. Now, is
3 that the understanding of the three panelists?

4 A Are you including me in
5 this?

6 Q Yes.

7 A I hadn't heard my name.
8 I understand that the route is to be constructed during
9 the winter, but I was not aware that the Kumak Channel
10 would be crossed in the summer.

11 Q Yes, well Dr. McCart, have
12 you yet had an opportunity to make or supervise any
13 studies on this part of the line?

14 A No.

15 Q Have you had an opportuni-
16 ty yet to review the information of Slaney?

17 A Yes.

18 Q -- that's set out in
19 the consolidated filing?

20 A I don't know. I've
21 reviewed Slaney studies in the area, yes.

22 Q Yes. I take it that
23 perhaps you would agree that this part of the delta
24 is of considerable importance for fish?

25 A Yes.

26 Q As I take it, all the kinds
27 of situations requiring fish protection that occur
28 along the delta portion of the cross-delta route also
29 occur in varying proportions on the Nig route?

30 A Yes.

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe,
Cross-Exam by Scott

1
2 Q I take it that in the
3 event that there is summer construction on the Kumak
4 Channel, that precautions that will be taken elsewhere
5 in the cases of summer construction, will be required
6 equally at Kumak?

7 A Yes.

8 Q Particularly at Kumak,
9 because of the influx of migrating fish?

10 A I don't know that Kumak
11 is any more important than other channels as far as
12 migrating fish goes.

13 Q I take it it follows that
14 the same precautions that you have described will
15 have to be taken at other crossings to protect over-
16 wintering fish?

17 A Yes.

18 Q The statements you have
19 made this morning in dealing with the cross-delta
20 route about clear lakes, turbid lakes, their avoidance
21 and the appropriate precautions apply equally, though
22 you may not have examined them in detail on the Nig
23 line?

24 A Yes.

25 Q Have you made any
26 recommendations to Arctic Gas with respect to the Nig
27 line that differ either in expansion in quality regard-
28 ing the Nig line?

29 A No. We have not surveyed
30 it ourself in detail and we can't make on site or site

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1
2 specific comments on it at this point.

3 Q Mr. Jakimchuk, I take
4 that the information that you have, apart from your
5 general knowledge of the area, about the Nig line,
6 is drawn also from the Slaney work, is it.

7 WITNESS JAKIMCHUK: That's
8 correct.

9 Q Yes, and do I understand
10 that in this area, the principal concern is disturbance
11 of grizzly bears which may have dens nearby?

12 A Yes, I would consider
13 that the principal concern, followed by some concern
14 for Arctic fox dens as well.

15 Q Yes. Do you know
16 whether this area has been used by reindeer during the
17 summer?

18 A The general area through
19 which the Nig line passes, has been used in the past
20 by reindeer and I understand, once again the latest
21 estimate is that it might be used by up to a hundred
22 animals. The general region of Richards Island, which
23 would include the portions of the line.

24 Q What do you know, if
25 anything, about muskrat in this area?

26 A Very, very little except
27 that it is not within the region considered to be a
28 high quality muskrat habitat in the delta. As a matter
29 of fact, it's within a low quality muskrat area.

30 Q Yes, now one of the things

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 you've said, I can't put my finger on the precise
2 words, but that when in the course of construction a
3 grizzly den is seen, avoidance will be recommended.

4 A That's correct.

5 Q What is contemplated by
6 that? First of all, when are you going to search
7 out these grizzly dens?

8 A Well, we have recommended
9 on several occasions that a den survey be done the
10 autumn prior to any winter construction so that we
11 could identify whether the alignment would impinge
12 upon a current den. We would also recommend following
13 that up with the immediate preconstruction survey
14 during the actual -- in advance of the construction
15 spread.
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Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q What period of time over
2 what month is the den used or occupied?

3 A Generally from October
4 to April.

5 Q Yes. And if, in the
6 course of your autumn survey, or -- well let me put
7 it this way -- when you conduct your survey, how remote
8 may a den be, to be of concern?

9 A Our recommendation is
10 basically composed of two parts. One, we recommend
11 the avoidance of denning areas where possible. That
12 is, areas that are known to be used year after year
13 by grizzly dens by more than one bear. Following that,
14 we -- and you'll find this in our recommendations
15 report which is forthcoming, have recommended that a
16 den that is in active use by a grizzly bear be avoided
17 by a distance of one mile.

18 Q Well now, if in the autumn
19 survey, or in the pre-construction survey, you find a
20 den occupied on the route, or immediately adjacent to
21 the route within the parameters you've described, what
22 do you propose to recommend?

23 A Well, we would hopefully
24 have this information in the autumn survey. We would
25 recommend avoiding that particular site by a necessary --
26 by a re-alignment, if possible. If that were not
27 possible, and right now this is not a recommendation,
28 but I'm just following up on it, if it were deemed not
29 possible to re-align, I would recommend that a wildlife
30 agency be contacted, to supervise the displacement of

Webb, Dabbs, Gunn, McCart,
Jakinchuk, Rowe
Cross-Exam by Scott

1 the bear from that den, prior to the onset of full-blown
2 winter conditions.

3 Q I'm advised for what it's
4 worth, that in Alaska, another technique is utilized.
5 That is the construction of that portion of the line
6 simply does not proceed, and the work crews work elsewhere.
7 Have you considered such a possibility?

8 A Well, I was aware of the
9 situation which I think I've referred to in private
10 conversation as the 16 million dollar black bear, where
11 construction was stopped, because of that particular
12 situation, a bear being encountered on the right-of-way;
13 and nobody knew what to do, and the cost escalated into
14 millions and millions of dollars.

15 I don't think it's necessary
16 to have to do that type of thing. That is why we
17 propose and have in our report, that we try to ascertain
18 if there's going to be a problem prior to the actual
19 construction, so that the contingency plan can be
20 put into effect. Better to do it then, than when the
21 ditcher wheel is on the spot.

22 Q So your contingency plans
23 are an autumn and pre-construction inspection --

24 A Correct.

25 Q -- plus if necessary --
26 a, I forget what you called it, there was a nice phrase,
27 a -- you didn't say disposal of the bear --

28 A No, I said the displacement.

29 Q The displacement of the bear.

30 A You see, what I'm saying

Webb, Dabbs, Gunn, McCart,
Jakinchuk, Rowe
Cross-Exam by Scott

1 there Mr. Scott, is that if you -- a bear will dig an
2 alternate den, and we have seen evidence of this in
3 our intensive grizzly studies in Alaska. A bear is
4 quite capable of seeking an alternate den site, in
5 the autumn, and it would be much more preferable to
6 disturb that bear, prior to the onset, the full onset
7 of winter, have him relocate himself, than it would
8 be to leave him there, and disturb him at a time of
9 year when his chances of survival were much less; and
10 as a matter of fact, I think it would be much more
11 humane to shoot the bear if it were disturbed in the
12 middle of winter, than it would simply to let him
13 wander across the tundra.

14 So, the contingency plan as
15 I see it is, number 1, to try to avoid the den itself.
16 If that can't be done, to displace the bear from the
17 site of hazard. If that can't be done, the options
18 available then become to tranquilize him and ship
19 him to a zoo, which is to me a reasonable thing to do,
20 or to dispose of him by shooting, rather than let him
21 perish on the tundra.

22 Q Now, have you made any
23 particular recommendations, to Arctic Gas, with respect
24 to this new portion of line, or is it premature?

25 A We have said that we
26 should conduct some further studies on it, and
27 particularly relating to this denning situation,
28 because from the information we have at present, it
29 appears that that is the most significant mammal problem.

30 Q Dr. Gunn, do I understand

1 that apart from your general knowledge, the precise
2 knowledge you have about this area comes likewise from
3 the Slaney report?

5 Q And from their reports,
6 is it correct to infer that this area is of some
7 importance to birds?

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 A We have studied the
2 report and studied the probable construction action
3 but of course we have not looked at it on the ground.
4 We have looked at the maps. Our opinion is that there
5 will be some local disturbance at the Kumak crossing
6 in the summertime, but that is very close to the Shell
7 camp, in any event; and that the rest of the route does
8 not present any particular problems to us,
9 although we would like to check it on a site specific
10 basis.

11 Q I take it that it's
12 clear that the entire route lies within the Kendall
13 Island Bird Sanctuary.

14 A No, I don't think it
15 does. I think that the western end of it does. I may
16 be wrong on that, but this is my recollection. I may
17 say the term "Niglintgak" translated into English is
18 "Pacific black brant" as Mr. Bayly told me some time
19 ago, and that may have symbolic overtones. Obviously
20 brant have been in the area.

21 Q Yes. Well, I am advised
22 that the entire route lies within the Kendall Island
23 Bird Sanctuary. If that were true, would that come as
24 some surprise to you?

25 A Well, let me see now, I
26 have to think about it. If you're advised that that's
27 true, I am prepared to accept it.

28 Q You know who is advising
29 me, don't you?

30 A Yes, I do, that's why

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 I'm not arguing.

2 Q Well now, and I take it
3 that one of the reasons it is a bird sanctuary, is that
4 in the summer and fall it's used for breeding and
5 staging by a variety of birds, including geese.

6 A Yes, the overall area
7 is of course important to birds, yes.

8 Q And that migrant snow
9 geese from time to time use this as a staging area in
10 the autumn of the year.

11 A I would like to look at our
12 maps on that. Migrant geese fly over the Taglu site
13 and they have been seen as far as the NiglintgaK site
14 on the ground. That's my recollection, without looking at it.

15 Q And I take it that it
16 follows therefore that you will have the same kind of
17 concerns at Kumak that you have at Shallow Bay, the
18 quantities are obviously different, but the same kind
19 of concerns about the scheduling of construction.

20 A Yes, it would certainly
21 be preferable to have the construction completed by
22 say the 25th of August.

23 Q Well now, have you con-
24 ducted a sufficient review to make any recommendations
25 to Arctic Gas about particular measures required on
26 this line?

27 A We have been asked to
28 report on our opinions and we have given a brief
29 opinion but we have not yet made any specific recommen-
30 dations.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Rowe
Cross-Exam by Scott

1 Q That, I take it, is some-
2 thing that remains to be done.

3 A Yes.

4 Q And would you in the
5 normal course be contemplating particular recommendations
6 in view of the fact that the area is a bird sanctuary?

7 A Well, we also have to
8 take into consideration the fact that the Shell site
9 is there and that there is a good deal of air traffic,
10 particularly helicopter traffic in and out of there,
11 and that that is very close to the Kumak Channel and
12 has to be taken -- considered in conjunction with that.
13 So that it's not simply taking place in a pristine
14 area in the bird sanctuary, it's taking place very
15 close to an industrial development.

16 Q Well, I take it, Dr.
17 Gunn, that all there is there now is the Shell staging
18 area; the pad and the other things aren't in place.

19 A That's correct, yes.

20 Q So that the recommendations
21 you make today, or in the immediate future, with
22 respect to that bird sanctuary, I take it, will not be
23 dictated by some event that you think is going to
24 transpire in the future, such as an oil pipeline or
25 a Shell station.

26 A I'm thinking of a Shell
27 gas station, not petroleum.

28 Q No, but I take it that
29 each member of the panel has been very clear to say that
30 their impact predictions and their recommendations are

Webb, Dabbs, Gunn, McCart
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Cross-Exam by Scott

1 based on what has actually been proposed by Arctic
2 Gas, and that they have not taken into account events
3 that subsequently or even concurrently may occur related
4 to other projects. The oil pipeline has been the
5 dominant one.

6 A Well, in this particular
7 case you're building a pipeline from one gas find to
8 another gas find, and if those gas finds are not
9 developed then there's no point in having a pipeline,
10 so you have to consider that the gas find is being
11 developed simultaneously with the pipeline.

12 Q But are your recommendations
13 as to what is to be done in this bird sanctuary going
14 to be blunted by the fact that Shell may get in there
15 without an environmental review?

Webb, Dabbs, Gunn, McCart,
Jakimchuk, Rowe
Cross-Exam by Scott

1 A I think I have to consider
2 in our recommendations, the probability that Shell
3 will go ahead with their plan to develop a wellsite
4 there, otherwise there would be no need for the pipe.

5 Q Yes. So that in that
6 particular case, you're content to look to the
7 occurrence of a probable event which may alter the
8 environmental balance before you arrive ?

9 A Before I arrive ?

10 Q Before the gas pipeline
11 arrives.

12 A I think that's feasible.
13 I don't think you can separate the two in this case.

14 Q No. No.

15 MR. MARSHALL: Mr. Scott,
16 you may not have been at the hearing, but Shell is
17 drilling there now. There are wells in the area.

18 MR. SCOTT: Mr. Commissioner,
19 those are all my questions. We have received I think,
20 the day before yesterday, Dr. McCart's recommendations
21 handily collated in book form, and I understand Mr.
22 Jakimchuk's, sir, on the way. In due course, it may be
23 that we'll be asking Mr. Marshall to bring these two
24 gentlemen back when we've had an opportunity to review
25 those recommendations.

26 But those are all the questions
27 I have today and I want to thank the panel very
28 much for their assistance.

29 THE COMMISSIONER: Well, do
30

1
2 you want them to commence the cross-examination of
3 Mr. Hemstock and Dr. Banfield now.

4 MR. SCOTT: Well yes, I
5 understand that's what Mr. Marshall wants and I'll ask
6 Dr. Sprague to wait.

7 MR. MARSHALL: Mr. Scott and
8 I exchanged words about this prior to commencement
9 of the session. Frankly, I don't there would be a
10 problem if we were to proceed that way because I shouldn't
11 think that there would be all that many questions and
12 I would have thought that the panel's cross-examination
13 could be completed in ample time to allow Dr. Sprague
14 to get, give his evidence, be cross-examined and be
15 away before the Coppermine people want to speak tomorrow.

16 If that seems to be not the
17 case, and that's an unreasonable assumption, then there's
18 some force to Mr. Scott's suggestion as Dr. Sprague who
19 has been sitting patiently, be allowed to give his
20 evidence.

21 MR. SCOTT: It's just, Mr.
22 Commissioner that I was asked to fill a gap, that was
23 created --

24 THE COMMISSIONER: Right, I
25 understand. Well, let's carry on with the cross-
26 examination of Messrs. Banfield and Hemstock and
27 we may be finished with them by coffee, who knows.

28 MR. HOLLINGWORTH: Well sir
29 any
30 if it's help to Mr. Scott, I think between Mr. Bayly
and myself we'll be something like half an hour.

1 THE COMMISSIONER: Good. Well,
2 that is a comfort to all of us.

3 (LAUGHTER)

4 MR. HOLLINGWORTH: I wouldn't
5 have said it if I expected that remark.

6 THE COMMISSIONER: I don't
7 have Dr. Banfield's evidence. I heard it read, but
8 if you have a copy of it, I'd like to have it.
(WITNESS ROWE ASIDE)

9 ALEXANDER BANFIELD,
10 R.S. HEMSTOCK, resumed

11 THE COMMISSIONER: Maybe
12 before you begin this, Dr. Banfield or Mr. Hemstock
13 could make any alterations in their evidence that
14 was read by Mr. Rowe the day before yesterday and it
15 was subject to -- both of you being allowed to change
16 it if you wanted to.

17 DIRECT EXAMINATION BY MR. MARSHALL:
18 Q Mr. Hemstock,
19 did you want to make any alterations?

20 WITNESS HEMSTOCK: Well, I
21 had made some changes in the text, which I believe
22 Mr. Rowe, and he's nodding his head, he has made
23 the corrections which I wanted to make.

24 Q Fine, Dr. Banfield?

25 WITNESS BANFIELD: No, I
26 have no corrections.

27 MR. MARSHALL:

28 Q Thank you.

29 CROSS-EXAMINATION BY MR. HOLLINGWORTH:

30 Q Mr. Hemstock were you
in Inuvik when Professor Bliss testified on behalf
of the producers?

WITNESS HEMSTOCK: Yes.

1 Q All right. Do you recall
2 his discussion of the Kendall Island Bird Sanctuary?

3 A I recall reading it.
4 I don't think I was there when it was being given. I
5 think I arrived at -- part way through that but I
6 have read the --

7 Q Well, my recollection
8 sir is that in discussing the Kendall Island Bird
9 Sanctuary, Professor Bliss pointed out that were the
10 boundaries of that sanctuary to be drawn up today,
11 they would likely take off some of the southern portion
12 around the Nig area and add to the north and easterly
13 portions of that sanctuary. Do you recall that evidence
14 sir?

15 A No sir.

16 Q Do happen to know on
17 the basis of your personal expertise if that would
18 be the case?

19 A No. My only knowledge
20 is, that I believe that Messrs. Barry and Dr. Gunn have,
21 from time to time, discussed the possibility that the
22 boundaries of the Kendall Island Bird Sanctuary are
23 perhaps not in the right place in the light of the
24 information we have today but I'm not aware of the --
25 where they would suggest they be changed.

26 Q Possibly Dr. Gunn might
27 be able to comment on that.

28 WITNESS GUNN: I understand the
29 general sense of your question, but would you mind
30 putting it --

Q Well, as I recall it sir, Professor Bliss, in his testimony in Inuvik stated that if the boundaries of the Kendall Island Bird Sanctuary were drawn today, that they would likely exclude part of the southern part in the Nig area and more likely take in a portion to the north and east of the present boundaries.

A Yes, I remember his testimony.

Q Would you agree with those sentiments?

A As Mr. Hemstock has said, I've discussed it with Dr. Barry and one or two other people -- our own people on occasion and I understand that the present, from an historical point of view, the present boundaries were located in part because of the ease of geographic location due to river channels and so on, but that the southern part of the sanctuary is not intensively used at the moment or is not nearly as much as other parts.

Whereas, over to the east, there are areas used particularly by brant for nesting, that it would be very desirable to have in the sanctuary. So, that's really all I know about it.

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth

1 Q Mr. Hemstock, prior to
2 a couple of months ago, it was Shell's intention as
3 I understand it, to ship its gas in a raw, unrefined
4 state, to Taglu for treatment there in the Imperial
5 plant. Is that correct?

6 WITNESS HEMSTOCK: I understand
7 that's right, yes.

8 Q And that pipe would have
9 been above ground, would it not, sir?

10 A I'm not sure that it would
11 have been above ground. I understand that there would
12 have been difficulty in carrying the raw gas, or the
13 wet gas, and preventing it freezing, but I'm not sure
14 that there had been a design for an above ground
15 pipeline.

16 Q Well, it would have been
17 easier technically to ship it above ground than below
18 ground, in its untreated state, wouldn't it?

19 A I think that that's
20 correct, and I believe it applies particularly to the
21 river crossings, where there is difficulty.

22 Q And as an environmentalist,
23 do you consider it more desirable to have an above-
24 ground pipe, or a below-ground pipe, in that particular
25 section?

26 A I think, that in this
27 location, that the fully buried pipeline is much
28 preferable.

29 Q Is there any disagreement
30 from the other panel members? Apparently not.

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth

1 WITNESS GUNN: Well from the
2 bird point of view, I don't think it matters a great
3 deal, whether it is or not, buried or above ground.

4 Q What if there was a noise
5 associated with it being above ground, would your
6 views still be the same?

7 A I think it would depend
8 on the intensity of the noise.

9 Q Dr. Banfield, can I refer
10 you to page 5 of your evidence, please?

11 WITNESS BANFIELD: Yes sir.

12 Q You're discussing the
13 Thunder River crossing there, and you state that the
14 pipeline crossing as it's proposed at the southern
15 end of the cross-delta alternative, is below the moose
16 wintering grounds in the Thunder River valley.

17 A Yes sir.

18 Q Is the proposed crossing
19 as it's now proposed in a different location from that
20 crossing site originally proposed by Arctic Gas?

21 A I was concerned particularly
22 about previous evidence given before this hearing,
23 a concern about the moose wintering grounds in the
24 Thunder River area, and in connection with the cross-
25 delta alternative and also the producers' environmental
26 impacts, more data was supplied to actually indicate
27 where moose concentrations were, in the Thunder River
28 area, and I noticed on the maps that I was examining,
29 the new route, that they were above the crossing.

30 Q Yes sir, but is this

Dable, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth

1 crossing a different location from that one originally
2 proposed by Arctic Gas?

3 A I can't -- I don't know
4 at this moment because I was doing this in isolation
5 in Scotland, and I've looked at so many different
6 and alignments, that I just can't reply at that moment --
7 at this moment to that question.

8 Q Mr. Hemstock, can you help
9 us out there?

10 WITNESS HEMSTOCK: My recollection
11 sir is that we have moved that crossing, but very
12 slightly from its original location. We would have
13 to check that.

14 Q Can you quantify "very
15 slightly," at this time?

16 A As I recall it's something
17 less than half a mile. I would want to check that.

18 Q Mr. Hemstock, do you
19 consider Shallow Bay one of the channels of the delta?

20 A Yes.

21 Q All right. So that that
22 is one of the channels you're speaking of when you
23 talk about channel crossings on the cross-delta route,
24 is it?

25 A Yes.

26 Q Sir, can I refer you to
27 page 6 of your testimony? Referring you particularly
28 to the last sentence, you say,

29 "The crossings on the delta channels, although
30 longer overall, are in slow moving water, and

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth

1 located in stable reaches of the river."

2 A Yes.

3 Q Now I understand it that
4 in the last twenty years the west bank of Shallow Bay
5 has eroded 500 feet.

6 A That's correct, however --

7 Q Yes, go ahead.

8 A -- I was talking about
9 here the matter of stability during the time of
10 construction, and the degree of difficulty that one
11 might have in making sure that that stability remained.

12 Q Well, it's reasonable to
13 presume, we've had -- that the erosion is going to
14 continue. Perhaps not at the same rate, and we've
15 heard evidence from the technical panel on this.

16 A I think that the -- yes,
17 the lateral movement could well continue. That is
18 provided, of course, that engineering means are not
19 taken to prevent that, such movement.

20 Q So that it really isn't
21 fair to call that a stable reach of the river, is it?

22 A I don't find that that
23 is a matter of instability that concerns the crossing
24 the pipeline, and certainly there is lateral migration
25 though.

26 Q Well surely then that's
27 of concern to the pipeline, sir. If you left it
28 without any special attention being devoted to it,
29 you'd have an exposed pipe in a matter of years, would
30 you not?

1 A Well you have a very
2 important assumption there, that it would be left
3 without any protection, and we would certainly not
4 propose to do that, and there was testimony presented
5 here last week, there are several methods of providing
6 that kind of protection.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 Q I have a further
2 important assumption to make and that is this, that
3 when you say that the crossings are located in stable
4 reaches of the river, you mean stable after they've
5 been treated by Arctic Gas.

6 A Yes, that's right, that
7 they are easy to provide that stability. The flow is
8 slow-moving, there is no great difficulty with ice,
9 there is no great difficulty with jamming, and we
10 believe that the stability can be preserved.

11 Q And does the same hold
12 true, sir, in North Reindeer Channel where your
13 reports show that the migrations have been 50 feet of
14 the right bank having been lost in 23 years, and 150
15 feet of the bank having eroded just downstream of the
16 crossing?

17 A I think it's very much
18 the same condition. That's a matter of a few feet per
19 year and that is in an area of the river which can
20 be -- where that kind of lateral migration can be
21 stopped.

22 Q And does the same, sir,
23 hold true in the Langley Island Channel where in 23
24 years there's been 100 feet of erosion on the left
25 bank?

26 A I would think that's
27 the same, yes.

28 Q So these are all stable
29 reaches of the river after they've been treated.

30 A They can be made ^{very} stable,

Webb, Dabbs, Gunn, McCart
Jakimchuk, Bantfield, Hemstock
Cross-Exam by Hollingworth

1 yes.

2 Q Has a similar rate of
3 erosion been shown at the Point Separation crossing
4 that was originally proposed by Arctic Gas?

5 A I don't think that there
6 is -- I don't know the lateral erosion at that point.
7 I would suspect that it's not very great.

8 Q All right, sir, and on
9 page 6 in that same paragraph a little further up you
10 say:

11 "The cross-delta route will require fewer
12 borrow pits than the original prime route."

13 Will it actually require less borrow?

14 A No, it will require more
15 borrow, but there will be fewer pits required.

16 Q And on page 7, you advise
17 us that the potential I.B.P. site on the Rat River
18 and McDougall Pass area would be avoided. Has it
19 become a matter of policy of Arctic Gas to avoid I.B.P.
20 sites?

21 A No, it's just noted that
22 that will be one of the factors.

23 Q Well, the inference is --

24 A We're normally not
25 greatly concerned with an I.B.P. site, unless there is
26 some particular area which is of special interest.

27 Q Well, the inference seems
28 to be that avoiding this area would be desirable.

29 A I think that that's
30 correct, yes.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 Q But the same consideration
2 wouldn't hold true in the famous Ebbutt Hills.

3 A That's another -- yes,
4 that's a matter that has to be considered.

5 Q You're still planning
6 to cross the Ebbutt Hills I.B.P. site.

7 A As far as I am aware
8 we are, yes.

9 Q All right, and on page 7
10 in the penultimate paragraph you talk about reducing
11 the level of activity in the delta in terms of air
12 traffic and river traffic.

13 A Page 7?

14 Q Page 7 of your testimony,
15 sir. Second to last paragraph.

16 A Yes.

17 Q Have you calculated what
18 the actual reduction in river traffic volume will be?

19 A In terms of river
20 traffic, no. We have made some calculations on the
21 necessary air traffic support for the compressor
22 stations.

23 Q And when you speak of
24 river traffic would you be talking about possible
25 barge traffic in West Mackenzie Bay?

26 A Yes, we would include
27 that, yes.

28 Q Well, yesterday, sir,
29 you weren't here but I put it to Mr. Webb that if
30 you brought the gravel backfill for Shallow Bay, which

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 is 340,000 cubic yards from Shingle Point, that would
2 require something like 377 barge loads, and since they
3 would have to make a trip empty and come back full,
4 that comes to something over 750 barge trips. Can you
5 still say that the cross-delta route is reducing
6 traffic?

7 A I think you can, sir,
8 because I was referring here primarily to the full
9 life of the pipeline and the support of the compressor
10 stations. Now during the construction there will
11 obviously be a good deal more activity in the delta
12 area with the construction of the cross-delta route.
13 With regard to the supply of gravel to those necessary
14 construction pads on Shallow Bay and the other crossings,
15 my information is that we still have some options there
16 on the method of supply. The material could be trucked
17 from Yaya Lakes as is presently done in island construc-
18 tion. It could probably be trucked from Shingle Point
19 over the ice in the wintertime, and it could also be
20 moved by barge. I believe that the method at the moment
21 that we would -- that engineering prefers is to move it
22 by barge.

23 Q Well, let's put aside the
24 construction for the time being, and talk about the
25 life of the pipeline. During the operations and mainten-
26 ance phase you'll be supplying the compressor station
27 near Tununuk Junction by barge, would you?

28 A You probably would be
29 supplying that station by barge, yes.

30 Q How many barges a year

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 would have to go in to supply that compressor station?

2 A I don't know, sir. It
3 would be relatively few because there's very little
4 supply required.

5 Q And given the old
6 site of this compressor station CD-08, how would you
7 supply it?

8 A That would have been
9 supplied by barge.

10 Q And the number of trips
11 to it would have been the same, wouldn't it?

12 A Yes.

13 Q So that the reduction
14 amounts to the fact that you're servicing fewer compres-
15 sor stations.

16 A Well, with regard to CD-08
17 the move of that compressor station to the eastern
18 side of the delta avoids the traffic into the delta.
19 That would have been required with the old location.
20 I was --

21 Q Of a few barges a year?

22 A Yes. I was concerned more
23 with the regular and routine air support of the field
24 office site at Inuvik to each of these compressor
25 stations.

26 Q So it was more the air
27 traffic you were thinking of, although you did put
28 in river traffic as well.

29 A That's right.

30 Q O.K., sir, now on page 1

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 of your testimony the last sentence in the first para-
2 graph says:

3 "I reasoned that it might be possible to build
4 a pipeline in those areas,"

5 referring to the cross-delta area,

6 "with less environmental impact than would
7 occur by the route proposed around the delta."

8 And then over on page 2 near the top you say,

9 "On balance it appeared that the cross-delta
10 route would be preferable,"

11 this is from an environmental standpoint,

12 "additional studies in greater detail were
13 under way at that time and these studies have
14 since been completed and in my opinion support
15 this conclusion."

16 So that's still your opinion, is it, sir, that the
17 environmental impact is less on the cross-delta route
18 than on the circum-delta route?

19 A Yes, I still believe that
20 it is.

21 Q All right, sir. Well
22 let's just if we can go through the panel. My under-
23 standing of Mr. Jakimchuk's evidence is that there's
24 a marginal advantage on the cross-delta route, but
25 very minimal at best. Is that fair to say, Mr.
26 Jakimchuk?

27 WITNESS JAKIMCHUK: I said
28 "somewhat preferable" many times, and I agreed that
29 "marginal" is equivalent to "somewhat preferable". Yes.

30 Q All right, sir, and Dr.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

1 McCart feels that there really isn't much to choose
2 between the two routes. Is that right, Dr. McCart?

3 WITNESS MCCART: Yes, that's
4 correct.

5 Q And Dr. Gunn clearly
6 prefers the circum-delta route. Is that right, sir?

7 WITNESS GUNN: That's correct.

8 Q And Mr. Webb will tell us
9 that whales aren't affected by the circum-delta route,
10 isn't that right, Mr. Webb?

11 WITNESS WEBB: Essentially so,
12 but I took more words than that to say it.

13 Q All right, and Mr. Dabbs
14 prefers the cross-delta route because it's easier to
15 vegetate, isn't that so, Mr. Dabbs?

16 WITNESS DABBS: There's the
17 two aspects, there's the matter of revegetation, there's
18 the matter of a shorter route, through a type of
19 terrain and vegetative communities that would recover
20 very quickly from construction as opposed to the upland
21 communities of the foothills of the Richardson Mount-
22 ains.

23 Q All right. Well, Mr.
24 Hemstock, in the face of that, I'll ask you again how can
25 you possibly say that there is an advantage to the
26 cross-delta route from an environmental point of view?

27 WITNESS HEMSTOCK: Well, I
28 think that the panel, with the exception of Dr. Gunn,
29 has come out that there is -- they are either neutral
30 or find some slight advantage in it.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Hollingworth

Q In what?

A I have added to that the
consideration of some other factors which include archaeolo-
gical concerns, the matter of somewhat less requirement
for borrow pits, that is the number opened.

Q But more borrow.

A But more borrow, and the
matter that in the long run there will be less air
traffic required across the delta, the matter that
under full load there would be somewhat less gas used
and to me that's an environmental advantage. I think
that I differ somewhat from the panel in that I put
more weight on the savings and to the environment by the
reason of construction of a considerably shorter segment
of line.

Q Well, let me just go
back a minute. You said that in the long run there would
be less air traffic across the delta.

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth

Q Well how is that the case
sir, when your original route didn't even go across the
delta?

A Because we have eliminated
two -- some compressor stations which were on the west
side of the delta, and which would have had to been
served from Inuvik, and which would require support.

Q Yes sir, but could not
planes leaving Inuvik climb to sufficient altitudes
when crossing the delta, for there to be absolutely
no effect whatever?

A I think that at 2,000 feet
altitude, there is probably minimum effect, but
nevertheless, there is some affect from air traffic.

Q Well let's say they climb
to 5,000 feet.

A Mr. Jakimchuk points out
they have to land again but there is --

(LAUGHTER)

THE COMMISSIONER: Keep that
man on the panel.

A -- certainly the impacts
could be minimized by restricting to certain altitudes,
but there is nevertheless, some kind of an impact
from this additional traffic.

MR. HOLLINGWORTH: Well sir,
I put it to you that the only reason that Arctic Gas
has opted to cross the cross-delta route is not from
any altruistic concerns about the environment, it's
for the fact that they're going to save 190 million

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Hollingworth
Cross-Exam by Bayly

1 dollars and that is that. Do you not agree with that
2 sir?

3 A I think that the 190
4 million is very important, but it's also very important
5 that we don't see any major difficulty in crossing
6 the delta from an environmental standpoint.

7 MR. HOLLINGWORTH: I have no
8 further questions.

9 WITNESS WEBB: Mr. Hollingworth,
10 may I just say something before you leave us. You
11 asked the panel in general whether we agreed with
12 someone's assumption -- I've forgotten who -- that
13 the below ground route would be more preferable than
14 the above ground, speaking of the lateral, the Nig
15 lateral?

16 Q Yes sir.

17 A I don't want it
18 misunderstood that my silence didn't necessarily mean
19 consent. I can't see any difference in terms of impacts
20 on whales.

21 Q I really wasn't^{too} concerned
22 about whales in the Kumak Channel, but thank you
23 for pointing it out.

CROSS-EXAMINATION BY MR. BAYLY:

24 O Mr. Hemstock,
25 you've stated that you consider some things that the
26 other environmental consultants didn't consider. Were
27 there some things that Arctic Gas have asked them not
28 to consider, such as the amount of gas that would be
29 used in powering the line across the delta?

30 WITNESS HEMSTOCK: No, I don't

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 think that we ever instructed them not to consider those.
2 It's simply that they concerned themselves with their
3 special areas of expertise, and some of these things
4 just lay outside that.

5 Q Well, what about aircraft
6 traffic? We know Dr. Gunn, for one, considered that.
7 We've heard that Mr. Webb was thinking about it. Now
8 these are things that may be beyond their expertise,
9 but we understand from what we've heard in cross-
10 examining them that they did consider these in making
11 their evaluation.

12 A Yes, I think they all
13 considered the impact of air traffic.

14 Q All right. So , this
15 is something that you've said you've considered, but
16 they did as well, in making their evaluation?

17 A I was mainly --

18 Q Yes.

19 A My consideration mainly
20 had to do with the long term operation and maintenance
21 of the line, and the fact that the base is going to
22 be in Inuvik. I'm not sure that that was fully
23 considered by the consultants. I simply haven't asked
24 them about that.

25 Q Now when I did the add-up,
26 I came to perhaps a different number than you did. My
27 impression of the answers given by the panel were that
28 there were two members of the panel who thought that
29 the circum-delta route would be better, and you'd only
30 included Dr. Gunn. I thought Mr. Webb had said that the

Dabbs, Webb, Gunn, Ranfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly.

1 circum-delta route would have less effect on the whales,
2 than the cross-delta route.

3 A That's correct.

4 Q That's potential effect.

5 WITNESS WEBB: Could I speak
6 to that? It was coaxed out of me that the whales
7 would not be directly involved. What I didn't say was
8 that ^{it's} probably the difference between no involvement and
9 negligible impact, which I think is perhaps just a little
10 different.

11 Q With the exception Mr.
12 Webb, as I understand your evidence in cross-examination
13 yesterday, of a greater than minimum amount of barge
14 traffic in the West Mackenzie Bay area, during the
15 time of summer construction.

16 A Yes, but I also said that
17 I was given to understand that that barge traffic
18 in fact may not take place during July, and my
19 assumptions were based upon that.

20 Q All right, and we still
21 haven't received an answer though from the applicant
22 of what that amount of barge traffic is. What I'm
23 suggesting to you Mr. Hemstock is this. That the
24 environmental consultants that have been hired by
25 Arctic Gas, may have said that the cross-delta route
26 is acceptable, but none of them to my knowledge, have
27 suggested that it is a great deal better. In fact,
28 we only have one that suggests that it's even -- or
29 two, sorry, that suggest that it's marginally better;
30 Mr. Jakimchuk and Mr. Dabbs; one that thinks it's

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 markedly worse; one that thinks that there's nothing
2 much to chose; and Mr. Webb, who, subject to barge
3 traffic, feels that it could be -- it's certainly better
4 to go around. Would you agree with that assessment
5 of what your consultants have said?

6 WITNESS HEMSTOCK: I think
7 that's right.

8 Q So what they've told you
9 is that it's acceptable?

10 A Yes, they've said that.

11 Q But you'd agree with me
12 that it may not be better?

13 A Well, I think that it's
14 somewhat better, but -- and I think that the vote, if
15 you like, on the part of the panel, and they probably
16 expressed themselves very well on this, the last two
17 days; is that there is really very little to chose
18 between the circum-delta route and the cross-delta
19 route.

20 THE COMMISSIONER: That's the
21 vote of the panel. What these gentlemen are getting
22 at is, given that vote, which appears to be pretty much
23 of a saw-off, that doesn't lean toward the circum-delta
24 route, how do you wind up weighing up the vote, and
25 coming out in favour of the cross-delta route?

26 A I think that really, I've
27 put somewhat more weight on the much shorter route,
28 and a few of these other factors which I just mentioned,
29 which, again, I'll admit, are not particularly
30 important from an environmental standpoint.

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

MR. BAYLY:

Q So, a lot of the weight

goes to the shorter route, and therefore to the saving
of money provided that the cross-delta route is acceptable
to your environmental consultants?

A Yes, it's a saving of
money, it's a saving of energy as well, and getting
the gas to market, which I think is an important
environmental concern.

THE COMMISSIONER: Well at
those last two considerations, the saving of money and
the saving of energy, have nothing to do with the
environment, at least, not in the direct sense. I'm
talking about comparison --

A They have nothing to do
with the specific environment of the delta, but they
do have a great deal to do with the, if you like, the
more total environment of Canada, or of the --

THE COMMISSIONER: All right.

MR. BAYLY: When you've taken
the vote -- Mr. Hemstock, when you've taken this vote,
I take it that means that you equate equally the
grass that will be disturbed with the potential
disturbance to the migrating waterfowl. You give each
consultant a vote?

A Well, not really no. These
are matters which --

THE COMMISSIONER: Excuse me
Mr. Hemstock. Mr. Hemstock gave them a vote, they
cast their ballots. He didn't weight their votes, and
he didn't even count them. He formed his own judgment.

Dabbs, Webb, Gunn, Banfield,
McCaig, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 That's what he did, he told us, and there's nothing
2 wrong with that; but I really think that's what he's
3 been telling us for 20 minutes now. Is that a fair
4 comment?

5 A Yes, and I should point
6 out that these matters are not a matter of voting.
7 When we discuss this, we've spent many hours around
8 the table discussing the pros and cons and so on, and
9 trying to get some evaluation of how you weigh an
10 impact of say, snowgeese versus an impact on some
11 other species; and of course it's -- Dr. Banfield's
12 pointed out. It's very difficult, so it's a matter
13 of judgment.

14 THE COMMISSIONER: Well, it's
15 very much like Lincoln saying to his Cabinet, when
16 against their collective judgment he decided to act
17 on his own judgment, he said, "Well, gentlemen, the ayes
18 have it."

19 MR. BAYLY: I don't think I
20 could have gotten away with that, Mr. Commissioner.

21 THE COMMISSIONER: It would
22 have been a suitable preface to a question.

23 (LAUGHTER)

24 MR. MARSHALL: Mr. Bayly's
25 getting gun shy.

26 MR. BAYLY: We've heard some
27 evidence, Mr. Hemstock, that there will be minimum
28 barge traffic during the summer months, but we weren't
29 able to pin down yesterday how much that minimum barge
30 traffic might be. Mr. Hollingworth was asking you today

Dabbs, Webb, Gunn, Banfield,
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 about the possibility of bringing quite a large
2 quantity of gravel, by barge, through the West Mackenzie
3 Bay area, at a time that may be important for the
4 whales which come in. Now, have you any idea of what
5 the logistics for barge support for the crossing
6 construction are likely to be?

7 A I don't have it available
8 to me here, but certainly we can get that for you. We
9 have that material.

10 Q Well perhaps that's
11 something you could share with both us and Mr. Webb,
12 because he seemed to feel that was pretty important
13 to his evaluation. Now, we've been supplied, just
14 before we began your cross-examination, with a summary
15 of -- with a notice to company personnel. This is
16 with regard to airplane regulations. Can you supply
17 us either now or later with an estimate of the air
18 support that would be required during the various times
19 for the construction of the cross-delta portion of
20 the Arctic Gas pipeline?

21 A I don't have that material
22 now, but we could -- I think we could supply that to
23 you.
24
25
26
27
28
29
30

Webb, Dabbs, Gunn, Banfield
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 Q Will you be able to
2 supply us information on the breakdown of the number
3 of aircraft that will be flying with instrument flight
4 regulations as opposed to visual flight regulations?
5 That is, some have to fly V.F.R., like helicopters and
6 small fixed-wing aircraft. Others may be able to
7 fly by instruments.

8 A The breakdown which we
9 have provides the data with regard to the size of
10 aircraft and I think a matter of judgement would let
11 you determine that.

12 Q Right, so --

13 MR. SCOTT: Mr. Commissioner,
14 it might help Mr. Bayly if I point out that there is
15 an outstanding undertaking that Mr. Marshall gave to
16 provide, in due course, a breakdown of flights during,
17 I think, construction and maintenance as between
18 various kinds of aircraft and numbers of flights and
19 I don't want to impede Mr. Bayly, but it seems to me
20 when that undertaking is discharged, we may want to
21 ask Mr. Hemstock or the biologists what they have to
22 say about it.

23 MR. BAYLY: I'm content with
24 that then, Mr. Commissioner and it appears from Mr.
25 Hemstock's answer as though that information is
26 available.

27 Q We've recently been
28 supplied with the summary of the evidence of Mr. Heacock
29 and I don't know if you've had a chance to have a look
30 at that yet, Mr. Hemstock. Can you tell me whether you

Webb, Dabbs, Gunn, Banfield,
McCart, Jakimchuk, Hemstock,
Cross-Exam by Bayly

1 have?

2
3 A No sir, I haven't.

4 Q Well in that he suggests
5 that the recommendations for flight levels which have
6 made by your consultants may be unable to be met and
7 perhaps you might look at that evidence?

8 A Is that the paper by
9 the gentleman from M.O.T.?

10 Q Yes.

11 A I have read that, but
12 I've forgotten that.

13 Q Would you care to
14 comment on that as to whether you agree with his
15 conclusions that we anticipate he'll be giving before
16 this Inquiry?

17 A I would like to see those
18 again. I've forgotten just ^{what} those conclusions were,
19 sir.

20 Q All right. Perhaps
21 you could have a look at those and supply us with an
22 answer when we see you next.

23 MR. MARSHALL: Are you dealing
24 with his comment on page five of that evidence, Mr.
25 Bayly, in the first paragraph. Is that the one that
26 you're --

27 MR. BAYLY: I don't have a
28 page reference here, Mr. Commissioner, but it may well
29 be one --

30 MR. MARSHALL: It says:

Webb, Dabbs, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Bayly

1 "It is clear that within existing legislation in
2 resources, it would be most difficult for Transport
3 Canada to guarantee full control."
4

5 Is that the one?

6 MR. BAYLY: Yes.

7 A Well, I might comment
8 on that, that we recognize that these regulations
9 which we have are only regulations that we can enforce
10 with regard to our own personnel or our contractor
11 personnel and they obviously, of course, would not
12 apply to any other traffic. I think that Dr. Gunn
13 has discussed that as a matter of his concern that there
14 is a good deal of other traffic which we cannot control
15 which will cause some disturbance.

16 Q All right. I'm not
17 concerned about your ability or inability to control
18 all the traffic in the north. I realize that's
19 impossible. I'm only concerned with the traffic that
20 your project might generate. Now, the notice that
21 you've handed out show no penalty for failure
22 to comply with the regulations set down by the company.

23 We've heard from Mr. Monaghan
24 in Inuvik that company regulations may well be difficult
25 to enforce, if not impossible and I want to know if
26 you would ^{be} recommending to Arctic Gas that there be
27 sanctions against pilots or charter companies or
28 company pilots if there are to ^{be} any, if they fail to
29 comply with these regulations and what those sanctions
30 might be.

Webb, Dabbs, Gunn, Banfield,
McCart, Jakimchuk, Hemstock,
Cross-Exam by Bayly

1 A Well that's the route
2 that we had expected we would have to take if there
3 were violations of the flight regulations that we have
4 for the company or contractor people. It may mean the
5 dismissal of a charter company or the dismissal of a
6 pilot if the regulations are not followed. It's a
7 matter, I guess, of just judgement of whether this kind
8 of action is taken on the first violation or whether
9 you have some sort of a point system and the dismissal
10 takes place after more than one occasion.

11 We have not any particular
12 policy in that area right now.

13 Q All right. But you'd
14 anticipate that it might be necessary to put some kind
15 of sanctions in if you had an errant pilot or company?

16 A Yes, I would think so.

17 Q All right. Now, I
18 brought up similar questions when I was cross-examining
19 Mr. Jakimchuk yesterday and they were with regard
20 to people who offend against company regulations or
21 perhaps government regulations about harassing
22 wild animals. Mr. Jakimchuk told me at the -- yesterday's
23 volume of the transcript 134, page 20216, line 13
24 in answer to the question:

25 "You'd want to see some teeth in the regulations
26 no matter whose they were, then I take it?"

27 Answer:

28 "Yes. You know, if a person is caught breaking
29 the rules, perhaps he should be fired for example."

30 Would you agree with Mr. Jakimchuk's suggestion that

Webb, Dabbs, Gunn, Banfield
McCart, Jakimchuk, Hemstock
Cross-Exam by Bayly

1 that might well be the kind of sanction you'd want to
2 place on people who offended against the molesting or
3 feeding of mammals, regulations?

4 A Yes, that's certainly
5 the kind of sanction you'd have to use and I think you'd
6 have to be fairly persistent in following that.

7 Q All right, and would it
8 be possible, do you think for the company to avoid
9 the situation we've heard of in Alaska where people
10 who are discharged merely go and hire on at the next
11 camp if they want to continue to work?

12 A Well, that's a matter
13 I think of, certainly outside of my expertise. It has
14 to do with the agreement between the company and the
15 labour unions. It's one that we hope we could make
16 stick, but I can't say that we could enforce those
17 kind of conditions under certain labour agreements.

18 Q Now on page 7 of your
19 evidence, in the third last paragraph, you state with
20 regard to the cross-delta route that it will avoid
21 the traditional hunting and trapping areas in the
22 vicinity of Aklavik, Fort McPherson and Arctic Red
23 River. Could you tell me please, sir if you've had a
24 chance to review the evidence given by the people of
25 Aklavik?

26 A I was at the first hearing
27 in Aklavik and I heard that evidence. I was not at
28 the second hearing.

29 Q All right. I'd asked
30 Mr. Rowe if he would care to comment and he suggested

Webb, Dabbs, Gunn, Banfield
 McCart, Jakimchuk, Hemstock,
 Cross-Exam by Bayly

1 I might ask you but we were informed at the Aklavik
 2 hearing that a number of people use the Shallow Bay,
 3 West Delta and Eastern North Slope area for both hunting
 4 and trapping. Is that something which you had any
 5 knowledge of prior to this?

6 A Yes. I was referring
 7 here to the area mainly, the area which lies to the
 8 east of Fort McPherson and Arctic Red which we were
 9 informed by local people there, was rather heavily
 10 used for trapping and for hunting. It's a lake area
 11 between those two villages and Travaillant Lake and
 12 also, of course, the area along the foothills of the
 13 mountains just to the west of Aklavik.

14 Then with regard to the cross-
 15 delta route, I have some -- we have some maps which
 16 I think came from your people or from COPE which deal
 17 with land use in that general area. Certainly the
 18 cross-delta^{line} does cross the areas which, according
 19 to those maps are used, but they would appear to be --
 20 the areas would appear to be very sparsely used in
 21 terms of trapping and so on, as opposed to the other
 22 areas which I described.

23 Q Well, several people in
 24 Aklavik and^{you} may want to check this out Mr. Hemstock
 25 referred to that area that I've described as their
 26 freezer or their bank and as I understand, it is not
 27 only important for trapping and there^{are} Andy Kayutak
 28 Willy Elanik and the Archies, Jacob and Elizabeth
 29 trapping there but this year, because caribou have been
 30 scarce, it has been drawn upon for moose hunting,

Webb, Dabbs, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Bayly

1 fairly heavily.

2 A Well, we'll certainly
3 check that up, but we were referring to those land use
4 maps from COPE.

5 Q Now, in answer to Mr.
6 Hollingworth's question about the policy of Arctic
7 Gas being not to avoid I.B.P. sites unless they have
8 some special significance, you may recall the evidence
9 of Dr. Peterson in which he stated that the proposed
10 I.B.P. site on the Firth river was, in his opinion, one
11 that should not be traversed by pipelines and I wonder
12 if that is the sort of thing you meant by "special
13 importance" or significance?

14 A No other -- the other
15 might members of the panel comment on that. That I.B.P. site
16 -- actually, it's a proposed I.B.P. site --

17 Q Yes, I'd refer to it as
18 proposed --

19 A Is very, very large and
20 we will certainly have to discuss with the proponents
21 just how important any piece of it might be. We
22 don't see anything particularly unique about the area
23 where the pipeline goes across but certainly the
24 site really cuts off the whole of the coastal area.
25
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Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Bayly
Cross-Exam by Scott

1 Q You'll be conferring then
2 with the I.B.P. Committee that's proposing these sites
3 to find out what their concerns are, I take it.

4 A Yes, as I think I have
5 mentioned here before, there are some I.B.P. sites
6 which have been extended in order to cross the pipelines
7 so that the impact of the pipeline can be measured, and
8 so if they're going to follow you around, you can
9 hardly avoid them. We would want to know what the
10 specific unique feature of this area was.

11 WITNESS DABBS: Mr. Bayly, if
12 I might add just a comment here. At the time at which
13 the work in the Northern Yukon^{vegetation} studies were carried
14 out, the I.B.P. or the proposed boundaries of the
15 Firth River I.B.P. site were considerably inland and
16 a much smaller area at the time, and it was a contri-
17 bution of the work that was done by members of my staff
18 added to the volume of knowledge regarding the Firth
19 River at the proposed site, and we believe that we're
20 on equal footing with them to discuss possible routes
21 in there.

22 Q So it may have been
23 your own fault for doing all that work that the I.B.P.
24 site got enlarged.

25 A I couldn't comment on
26 that.

27 MR. BAYLY: Those are
28 all the questions I have. Thank you very much.

29
30 CROSS-EXAMINATION BY MR. SCOTT:

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 Q Mr. Webb, first of all
2 I think you hold me responsible for having coaxed
3 something out of you yesterday. Let's have it clear
4 now, just so there won't be any doubt. As between
5 the cross-delta and the circum-delta route, which do
6 you prefer?

7 WITNESS WEBB: I've been
8 thinking of a way to phrase it, and I think it's fair
9 to say that the circum-delta route would eliminate
10 any possibility of interference with whales.

11 Q And therefore, I take it,
12 you prefer it?

13 A It would be my preferred,
14 yes.

15 Q All right. Mr. Hemstock
16 --

17 THE COMMISSIONER: Excuse me.
18 Dr. Banfield wanted to get in on this before the thoughts
19 leave him.

20 WITNESS BANFIELD: Well, I
21 just note that belugas are getting a vote, and I
22 wondered if you were going to give each species a
23 vote? If so, the consultant who should speak up for
24 Dall sheep might mention that the cross-delta route is
25 much preferable as far as Dall sheep are concerned.

26 MR. SCOTT: Q Dr. Banfield,
27 in your absence we dealt with that yesterday, you'll
28 be glad to hear, and a review of the transcript I
29 think will reveal that the consultant did speak to that
30 matter. I'll have some questions of you about the
whale alarm system in a minute, but I just want to --

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 A I'm glad to see you had
2 the Dall sheep in mind.

3 THE COMMISSIONER: Mr. Jakimchuk
4 wanted to speak.

5 WITNESS JAKIMCHUK: Just to add
6 one comment with regards to Mr. Webb's last clarifica-
7 tion, it's my understanding that if one did go circum-
8 delta that wouldn't totally eliminate barge traffic
9 in the area of concern.

10 MR. SCOTT: No, I think Mr.
11 Williams has made that clear, Mr. Jakimchuk.

12 Q Mr. Hemstock, I don't
13 want to trouble you any more about your additions or
14 your counting of votes or anything like that, but I
15 take it that it is fair to say that in this panel are
16 your environmental advisors, you have no others apart
17 from the representatives of the same company. That's
18 your environmental team we see before us.

19 WITNESS HEMSTOCK: These
20 people and their staffs.

21 Q Yes, and that Mr. Webb
22 we had yesterday, came fairly late to the exercise
23 and his function before that was provided by our
24 cheerful resident mammalogist, Mr. Jakimchuk. Do I
25 have that right?

26 A I think that's right,
27 yes.

28 Q Now, I detect that in
29 the opinion that you have provided, there have been
30 two additional factors that you've put into the

Webb, Dabba, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 environmental mix, the first is the economic one and
2 the large environmental issues about consumption of
3 gas that arise out of that, and I don't want to trouble
4 you with that any more. The other one seems to be a
5 view which I think requires some honest examination,
6 that shorter is better, if I can put it that way.
7 Would it be that that is the thing that tipped the
8 balance for you?

9 A Yes, I guess I attach
10 quite a bit of importance to getting from point A to B
11 with a pipeline as quickly as possible.

12 Q Well, let's look at
13 shorter is obviously better in economic and other
14 terms, let's see if we can look at shorter is better
15 in environmental terms; and I take it that if you
16 have two routes that are exactly the same length and
17 one has an impact value of X and the other has an
18 impact value of Y, it's easy to pick which route you
19 prefer in environmental terms. You simply measure
20 the impacts of two equally lengthy routes and decide
21 that the one with the lesser impact is, in environmental
22 terms, is preferred.

23 A Well, I suggest that
24 even that's a very difficult exercise because it's
25 almost certain that the impacts are not going to be
26 the same, for separate species, and therefore if you
27 check with a panel like this or check with another
28 panel you might get quite different ratings on the
29 importance, and therefore with equal length routes
30 I'm sure you'll get a rating of X for one and Y for the

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, ~~Hemstock~~
Cross-Exam by Scott

1 other, and the argument then among the biologists is
2 "Which is greater, X or Y?"

3 Q Yes. But once you've
4 decided that it's easy to pick your route when they're
5 equal length.

6 A Well, there are many other
7 factors too.

8 Q Yes. But a complicating
9 factor is when the route with the Y value is twice as
10 long, let us say, for example.

11 A That's right.

12 Q And I take it that in
13 those circumstances what is required is a very sophisto-
14 cated comparative study to determine whether shorter is
15 better, or whether in fact longer is better.

16 A That's a fair assumption.
17 I might go on to point out that I don't think that we
18 have the tools for the evaluation in what you call a
19 very sophisticated study.

20 Q No, that was precisely
21 the point I was going to make. We cannot therefore
22 assume that shorter is better, can we, in environmental
23 terms?

24 A Oh no, you can't assume
25 that.

26 Q No, and there is no study
27 upon which you rely that shows that shorter in this
28 case is better.

29 A No.

30 Q Well now, what would --

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 let me stipulate one condition. Let it be assumed that
2 an oil pipeline will follow in due course the cross-
3 delta route or the circum-delta route. Are you in
4 any position to determine in that eventuality which
5 of the two routes you would prefer?

6 A No, I'd have to know a
7 lot more about the construction methodology for the
8 oil pipeline and the factors about the pipeline.

9 Q Well, let me ask you this,
10 wouldn't the risk, no matter how modest it may be,
11 of oil spills from an oil pipeline lead you to
12 reverse the preference in favor of the circum-delta
13 route as a starting point in your thought process?

14 A I couldn't -- no, I
15 couldn't jump to that conclusion now. The concerns
16 I would have, of course, are -- would have to do with
17 oil spills. As you point out, they are very, very
18 infrequent, and therefore you have to evaluate that
19 factor when you begin. Obviously the greatest concern
20 has to do with the spilling of oil into the water
21 system but the circum-delta route being very much
22 longer has therefore on the basis simply of length, a
23 greater possibility of a spill occurring.

24 Furthermore, any spill which
25 occurs on the circum-delta route and which got into a
26 water course would immediately get into the delta. As
27 a matter of fact it would get into the delta upstream,
28 and in the relatively faster water it would be more
29 difficult to control. So when you put all those
30 factors together it seems to me that there are so

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 many things to consider that it would be inappropriate
2 for me to try and make a judgment on that now.

3 Q Yes. Well now, let me
4 just get one other thing about the processes that lead
5 to the environmental judgment that Arctic Gas makes.
6 When you have, let us say, three advisors on environ-
7 mental matters and two are more or less neutral, and one
8 if I may say so, is rather vigorously opposed to a given
9 route, don't you begin by saying, "Well, all other
10 things being equal, the one who is vigorously opposed
11 should have the advantage if the others are relatively
12 neutral"?

13 A I would want to know the

14 --

15 Q Who it was?

16 A -- well, the reason for
17 the opposition and I would want to make my own
18 evaluation of the length of time that the concern might
19 be and how seriously I evaluated that concern.

20

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Dabbs, Webb, Gunn, Banfield
 McCart, Jakimchuk, Hemstock
 Cross-Exam by Scott

Q You take the bird concern seriously, I've no doubt.

A Yes sir.

Q Yes and you don't quarrel with Dr. Gunn's assessment of them.

A I quarrel, I suppose a bit, with his assessment of how serious it is.

Q Yes, but you're obliged to rely on his advice, aren't you? You've no other. Isn't that correct?

A Yes.

Q Yes. So, that in that sense, you take his concerns and his statement of view seriously?

A Yes sir.

Q It's clear to you, is it not, that his opposition to the cross-delta is, if not fixed and implacable, at least reasonably firm?

MR. MARSHALL: I think he said it was acceptable.

A Yes, Dr. Gunn has said that the cross-delta route is acceptable. He's told us where his concerns are and we've evaluated that. We have one other panelist, you know, that we haven't polled yet.

Q Well, I'm interested --

A -- who's also considered all of these matters.

Q Well now, I take it from your prepared evidence that you also felt obliged to

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock
Cross-Exam by Scott

1 look at socio-economic considerations.

2 A I just took a -- this is
3 certainly not my area of expertise and I -- we couldn't
4 detect any great difference again on the socio-economic.

5 Q Yes. Well you say, at
6 one page,:

7 "It appeared to us that the cross-delta route
8 might be preferable"
9 and you were talking about socio-economic matters,
10 "in that it would avoid crossing certain areas
11 that have been traditionally used by people from
12 Aklavik, Fort McPherson and Arctic Red"

13 and then subsequently on page number seven you say:

14 "The cross-delta route will avoid traditional
15 hunting and trapping areas in the vicinity of
16 Aklavik, Fort McPherson and Arctic Red."

17 and I take it that similar statements appear in the
18 consolidated filing that you made..

19 Was that a factor that you
20 put into the decision making process?

21 A Yes, it was a factor that
22 I put into it, yes.

23 Q Yes. Well now, I take
24 it, Mr. Hemstock, that you would agree that in order
25 to weigh those socio-economic considerations, you have
26 to have the following material at hand and I'll just
27 read it out. You have to have first of all, "an inventory
28 in some terms of the biological resources that ^{are} in the
29 vicinity and that therefore are at risk."
30

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Scott

1 That is, the size and importance of resources that
2 could be damaged if all did not go well.

3
4 That has to be considered,
5 doesn't it?

6 A That's one of the factors,
7 yes.

8 Q The second factor that
9 has to be considered surely, is :

10 "an estimate has to be made of the actual effect
11 of the pipeline project on the populations
12 comprising those resources and for the affect of
13 the pipeline on the accessibility of those resources
14 for exploitation."

15 A Yes.

16 Q Yes. Third thing you
17 have to have is:

18 "You have to know the use that is made by the
19 local people of the land and resources along the
20 competing routes and the intensity of such use;
21 that is, the activities and harvests that could
22 be affected if all did not go well."

23 A Yes.

24 Q Yes. The fourth thing,
25 I suggest you have to have, is ^{you} have "to have an estimate
26 of the probable effect of the project or the competing
27 lines on the places and ways people live and travel and
28 work and hunt and trap and on the capacity of the
29 land to yield the same harvests for the same effort
30 as before."

A Yes.

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Scott

1
2 Q Yes. I take it that
3 fifth, you have to have in the mix:

4 "The attitude of the local people respecting the
5 two competing routes and their views with respect
6 to them from a hunting, trapping and other points
7 of view".

8 A Yes.

9 Q Yes. Well now, have
10 you any study or a report or analysis that:

11 "A. Provides any of this information or assists
12 you in making a judgement with regard to those
13 five factors when you are selecting between
14 the cross-delta and the circum-delta route?"

15 A Yes, we have much of
16 that information and I believe that it'll be covered
17 in phase four. The information with regard to the
18 trapping areas was part of a study that was done two
19 or three years ago and I, in response to Mr. Bayly's ^{question,}
20 our information is that the areas through which the
21 circum-delta line went, were more heavily utilized than
22 the proposed cross-delta route.

23 Q Mr. Hemstock, if I could
24 interrupt you just for a moment -- with the five
25 characteristics I've listed, you agree with me that
26 heavy utilization is only the starting point, isn't it?
27 What we're concerned about is not heavy utilization
28 but in part the extent to which the utilization can be
29 tolerated and the extent to which it is relied upon,
30 even if it not be particularly heavy in some cases.

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Scott

1 Those are factors, aren't they?

2 A Those are factors, yes.

3 Q Well, now what I'm asking
4 you is, can you point me to, well in advance of phase
5 four, the reports or studies that assisted you in any
6 judgments you came ^{to} that for some reason the cross-delta
7 route was socio-economically to be preferred? Or was
8 it just a good, sound guess made by you?

9 A It was - no it was
10 based on information which appears in the Gemini report,
11 and also material gathered by Mr. Jakimchuk's firm on
12 the utilization of these areas.

13 Q Well, those are two reports
14 we'll look at for that information. Are there others?

15 A I think that those are
16 the basic ones. Then there's the maps which Mr. Bayly
17 has provided which show the land utilization over
18 the delta and the outer delta area in particular. There
19 are -- again, it's certainly not in my area of expertise
20 but our socio-economic people have advised us that
21 we should keep the pipeline as far away as possible from
22 the villages and this is another factor that appears
23 to weigh in favor of the cross-delta route which I
24 didn't mention but the circum-delta route does go close
25 to those villages.

26 I think that that -- and this
27 is a personal opinion, I think that that might not
28 necessarily in the long run be an advantage because it
29 would make it very difficult, not impossible some time
30 in the future to supply fuel -- gas to those villages.

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock,
Cross-Exam by Scott

1 So that this may not be an advantage in the long run.

2 Q Well, if you look at figure
3 nine in the supplement to applications in Exhibits
4 respecting the alternative routing, page 58, you've
5 set out a map that shows the approximate location of
6 reindeer herd grazing area and trapping areas for the
7 residents of Tuk, Inuvik and Aklavik. I've got it
8 here if you want to see it and I ask you to observe,
9 first of all, that if it shows that the delta with
10 the exception, I'm glad to say of Shallow Bay, is
11 extensively used for all these activities.

12 A What section is that in?

13 Q It's the last section
14 in the book. It's "Environmental Statement" and it's
15 page 58 at the bottom. But looking at that, does
16 that not make it clear that the entire area of the
17 cross-delta route is utilized at least for one of
18 the purposes that is shown on the map?

19 A Well, I would think not.
20 The cross-delta route, there is --

21 Q The vacant spot is Shallow
22 Bay that I --

23 A Well, it's a lot more than
24 Shallow Bay. Shallow Bay is about a third of that
25 vacant area there and it extends over to Langley Channel
26 and if you compare the total length of land utilized on
27 the cross-delta route with the circum-delta route,
28 you'll find that there's many more miles on the circum-
29 delta route. I point out too, that the Richards Island
30 which is an area for the Tuk people, is crossed either

Dabbs, Webb, Gunn, Banfield
McCart, Jakimchuk, Hemstock
Cross-Exam by Scott

1 with the circum-delta route or the cross-delta route.
2 It's about equal.

3 Q Well, let's take it step
4 by step. It's clear from that map, is it not, that
5 the cross-delta route or portions of it are used for
6 Aklavik trapping areas and Inuvik trapping areas?

7 A Their portions of it, yes.

8 Q Yes, now what I'm asking
9 you, is apart from Gemini North and what is in Mr.
10 Jakimchuk's report, how did you -- on what information
11 did you conclude that that was somehow less critical
12 than the trapping areas on the prime route?

13 A Well, the other source
14 of information is the COPE maps.

15 Q Yes. .

16 A Again there, the utiliza-
17 tion is shown ⁱⁿ lines which I presume are traplines or
18 travel lines and think that this map here is a pretty
19 good summary. You can see that the cross-delta route
20 might have, perhaps at the most, 15 miles of the cross-
21 delta portion which is utilized. You'll see that it's
22 at the ^{very} northern extremity of that area utilized by
23 Inuvik, whereas the circum-delta route has many more
24 miles.
25
26
27
28
29
30

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 Q What I'm getting at and
2 perhaps we're not on the same wave length, is apart from
3 those materials you've told us about, why do you
4 conclude that one area is more critical than the
5 other? Is it simply because more people use it?

6 A I think that's a pretty
7 good reason, yes. More people use it and there are
8 many more miles of it being used in the circum-delta
9 route.

10 Q Well, what regard do you
11 have for whether the use is significant in terms of
12 populations? What I'm suggesting to you, Mr. Hemstock,
13 is this, that a great deal more in the way of sophis -
14 ticated information is required before you can say
15 affirmatively that the socio-economic effects of
16 using one route are better than those involved in
17 using the other?

18 A If you took the total
19 socio-economic impact I could agree. I wouldn't agree,
20 though, with regard to the trapping and hunting and
21 hunting areas which we're discussing here.

22 Q Do you really think that
23 a hunting area measured in terms of its importance
24 as a subsistence area is governed by the number of
25 pelt that are taken?

26 A I think that that would
27 be a good indication of productivity.

28 Q Well, it certainly may
29 have to do with productivity, but that's not what
30 we're talking about, is it? We're talking about the

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-kxam by Scott

critical nature of these hunting areas to the communities that depend on them.

A Well, I think productivity is very important to that critical nature.

Q And I take it that the problem only becomes more complex when we introduce things beyond reindeer and trapping areas such as caribou, whales, and geese.

A Yes, it becomes more complicated.

Q And I suggest to you, Mr. Hemstock, that you're not in a position at this time to determine the socio-economic consequences of routing either cross-delta or circum-delta.

A I think that I'm not personally able to take the total socio-economic impact but certainly with regard to the utilization of the land area required for the two routes, and with respect to hunting and trapping, I would have no difficulty in coming up with a recommendation, and that is that the circum-delta route impacts on considerably more land.

Q Well, let me turn to the last area. On the wall -- last week when we had the technical panel, Mr. Williams responded to some questions that Mr. Marshall asked him about the proposal that Dr. Barry had made that the Yukon Slope route should move from Dew Line station to Dew Line station, and I think you were perhaps present, were you, when that evidence was given by Mr. Williams?

A Yes sir.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 Q And I understand that
2 Mr. Williams had a number of objections to it, most of
3 them related to the fact that it was an abstract consider-
4 ation at the present time.

5 A No, I don't agree. He
6 had several objections to it and one of the primary
7 ones was that it meant crossing the wide fans of all
8 the rivers and streams draining into the Beaufort
9 Sea, and he found that a situation not to his liking
10 from an engineering standpoint.

11 MR. SCOTT:

12 Well, to reduce the
13 matter from whatever abstract considerations were
14 involved, I've asked Dr. Barry to route a line as
15 best he can from the Alaska border to the cross-delta,
16 and I wonder if Arctic Gas has any objection to examin-
17 ing that as they've examined the other cross-delta
18 alternative and permitting their experts to examine
19 it and to let us have their comments on it?

20 MR. MARSHALL: We'd certainly
21 be prepared to examine it and give you comments. We
22 may be able to give you some, I suppose, tomorrow
23 morning, but we'll let you know.

24 MR. SCOTT: Well, I --

25 MR. MARSHALL: I take it
26 you want Mr. Williams to take a look at it and do some
27 comments. You want geotechnical comments as well, do
28 you?

29 MR. SCOTT: Well, I'd be grate-
30 ful for a mini-assessment of that route in order that
31 if there is a useful alternative to the route that

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 is now proposed, we should hear about it.

2 MR. MARSHALL: We'll do our
3 best.

4 MR. SCOTT: And what we're
5 particularly interested in is the comments of the
6 biologists, and I've no doubt the comments of Mr.
7 Williams and his advisors.

8 A I think that we can
9 provide that because as was I'm sure testified to right
10 at the start of these hearings, there was a great deal
11 of discussion about the location of the route across
12 the North Slope, and considerable study right from the
13 foothills right to the shore line, so we can provide
14 those general comments.

15 Q And one last matter, when
16 my colleague Mr. Goudge, was here last time he attempted
17 to obtain, as Mr. Marshall will recall, the cost
18 involved in moving CD-08 and it was asserted, I think,
19 that with some justification that because that was a
20 unique movement the information provided would not
21 be helpful. In the event that the Yukon proposal con-
22 tained on the wall involves the movement of CD-08 or
23 any other compressor station adjacent to the delta, we
24 would like then, Mr. Marshall, to have the costs
25 involved in making that movement, as compared with the
26 costs of moving CD-08.

27 WITNESS JAKIMCHUK: May I
28 interrupt?

29 MR. MARSHALL: I'm not sure
30 that I'm completely with you. There is one matter

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 that we didn't address and I intended to deal with in
2 reply, and that is whether or not Dr. Barry's route --
3 and I gather this is all Dr. Barry's route -- CD-08
4 would have to be moved again in order to accommodate
5 the additional ten miles.

6 MR. SCOTT: That's why we would
7 like the costs involved in doing that.

8 MR. MARSHALL: So you want to
9 know if we would have to move CD-08 again and how much
10 that would cost?

11 MR. SCOTT: No, what we want
12 is we would like to know the costs involved in moving
13 CD-08, as you have now done. Now that evidence you
14 objected to last time on the grounds that it won't be
15 meaningful.

16 MR. MARSHALL: That's right and
17 I was upheld in my objection.

18 MR. SCOTT: That information
19 obviously becomes directly meaningful if you assert
20 that Dr. Barry's route means that you have to move
21 CD-08 back, or that the Yukon proposal means that
22 you have to move CD-08 again. It's in that context
23 that I therefore ask for that information, if those
24 movements are necessary. It may be that you can absorb
25 the costs, leaving CD-08 where it is.

26 MR. MARSHALL: That's a little
27 too tricky for me to absorb before I've had coffee Mr.
28 Scott.

29 THE COMMISSIONER: I'm having
30 the same difficulty.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

1 WITNESS JAKIMCHUK: May I just
2 ask one question for this mini-assessment that we're
3 to make? I notice the red line stops at the Alaska-
4 Yukon border. What are we to assume for the Alaska
5 portion of the environment?

6 MR. SCOTT: Well, what did
7 you assume when Arctic Gas asked you to make your
8 application --make your assessment?

9 A We assumed that the
10 alignment we had was the route.

11 Q All right, well you make
12 the same assumption with respect to this one.

13 A We have nothing there,
14 it's a blank. It's a significant point, that's my
15 query. Are we to assume, for example, that the
16 existing alignment comes to the border and jogs to
17 the north, or that there is an extension along the
18 coast?

19 Q I've asked you in making
20 your assessment not to concern yourself with the
21 join at the Alaska border. In other words, you may
22 assume that it joins where the line is shown on the
23 map.

24 MR. MARSHALL: Let me take that
25 under consideration. I don't know whether we'd be
26 prepared to make that assumption. Let me discuss that
27 with Mr. Hemstock.

28 THE COMMISSIONER: How much
29 longer will you be?

30 MR. SCOTT: I'm finished, sir.

Webb, Dabbs, Gunn, McCart
Jakimchuk, Banfield, Hemstock
Cross-Exam by Scott

THE COMMISSIONER: Pardon?

MR. SCOTT: I'm finished.

THE COMMISSIONER: All right,
well then we'll adjourn for coffee and ^{could} we then hear
the evidence of Dr. Sprague in chief.

MR. SCOTT: Oh, I was going to
ask about the whale ^{bell}, but I won't trouble Dr. Banfield
about that.

THE COMMISSIONER: Well, we'll
adjourn for coffee then.

(WITNESSES ASIDE)

(PROCEEDINGS ADJOURNED AT 2:55 P.M.)

1 (PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

2 THE COMMISSIONER: Well, we'll come
3 to order again ladies and gentlemen.

4 MR. SCOTT: Dr. Sprague please.

5 MR. MARSHALL: Perhaps just
6 before he steps up sir, I would be entitled to redirect
7 with respect to this panel?

8 THE COMMISSIONER: Of course.

9 MR. MARSHALL: In view of the
10 fact that Mr. Hemstock and Dr. Banfield just arrived
11 this afternoon, I'd like to reserve my right to call
12 some redirect tomorrow morning. I don't expect there
13 will be any, but I'd like to talk to Mr. Hemstock
14 about it.

15
16 There were a couple of things
17 that Mr. Webb was asked about, and he gave undertakings
18 on, and he could respond, partially at least now, sir,
19 if that would be convenient, so as to complete as much
20 of the evidence as possible without recall.

21 THE COMMISSIONER: Well maybe,
22 since the panel has stood down, is this panel leaving
23 on the morning plane, or is there an evening flight
24 out or what?

25 MR. MARSHALL: I'm not sure
26 what their plans are, sir. It would just take a moment
27 for Mr. Webb to deal with --

28 THE COMMISSIONER: Well why
29 don't you step up again Mr. Webb? I don't see you back
30 there -- oh, there you are.

R. Webb
10 DIRECT

RE-DIRECT EXAMINATION BY MR. MARSHALL

ROBERT WEBB, resumed:

MR. MARSHALL: There were four things Mr. Webb. When you were asked about your observations about the boat and barge traffic, and you undertook to give a response, I gather that you've got part of it worked out, you'd like to file a letter later dealing with that. Is that correct?

WITNESS WEBB:

A Yes, I would prefer to have a look at the raw data which we don't have, and I would undertake to file a letter, if that's all right.

Q Mr. Bayly asked you about ice, and the artificial islands. Are you able to respond to that question?

A Yes, in a very general way. Mr. Commissioner, I don't know if you have our '73 Whale Report available or not, but there is a map here in it, which would help to illustrate what I'm going to say. As requested, I believe was raised by Vince Steen at the Tuktoyaktuk Community hearing, and the point was whether or not a number of artificial islands offshore would in fact maintain the ice for a longer period, and therefore delay the arrival of whales to the estuary. In the map that you have before you, I think you can see the white representing an arc, or a band of ice, more or less around the outside of the Mackenzie estuary. The period I believe is late June, early July. This feature of an ark of ice around the delta develops each year at that time, and it's a considerable distance offshore. I think in the West Mackenzie Bay it's about 50 miles from the mouth of

R. Webb
Re-Direct

1 Shallow Bay, to the inner perimeter of this band of
2 ice.

3 It's landfast ice^{at} either end.

4 It's left there when the main polar ice mass breaks
5 away, and is forced out by offshore winds, and it
6 takes some time for that arc, or band of ice to crack
7 and to melt, and to allow the whales into the estuary
8 proper. I think the fortunate thing is that the band
9 of ice is usually, or generally in deeper water, and
10 quite a bit further out than^{any} island construction that's
11 taken place to this point, and I believe I'm correct
12 in saying, probably further out and in deeper water,
13 than the conventional type of island construction would
14 take place. I think that's generally planned for
15 shallower depths.

16 With one exception, and that
17 is, at the north end of Richards Island proper. You'll
18 see that the ice actually connects with Richards Island,
19 and there is a possibility that a number of islands
20 in that area may have some delaying effect on the
21 breakup of ice in that area. Over in -- off Kugmallit
22 Bay, which is of interest I think most to Vince Steen
23 I doubt very much whether islands would be constructed
24 in that far out, and I think that the delaying effect
25 would be minimal if it existed at all, in that area.

26 MR. MARSHALL: Mr. Bayly, do
27 you have any questions?

28 MR. BAYLY: No,^{just to} thank Mr. Webb
29 for that information and we'll convey that to Mr. Steen.

30 MR. MARSHALL: Mr. Bayly also

R. Webb
Re-Direct

1 asked about a letter from Dean Fisher, and you've had
2 a chance to check that. Could you deal with that now
3 Mr. Webb?

4 A Yes. Not to introduce
5 a more somber note to what has been an enlightening
6 afternoon, but I have a confession to make. It concerns
7 my relationship with Lorraine Allison. I have a guilt
8 feeling there which I think is easily purged. I, in
9 fact, did not recognize the letter from the paragraph
10 quoted to me, or paraphrased by Mr. Bayly, but I had
11 my secretary check my files, and indeed there is such
12 a letter. It was addressed to me by Dr. Dean Fisher
13 on March 25, 1973, and was a letter written at my
14 request, asking for information from him on the general
15 extent of knowledge of the effects of oil on whales;
16 and I have the paragraph here that was quoted to me
17 over the telephone, and perhaps I could just read it
18 into the record if you wish.

19 Dr. Fisher quoted Dr. Sérgeant,
20 in fact, who had had personal communications with
21 Dr. W. Utrecht, U-t-r-e-c-h-t, of the Netherlands, so
22 it's not what you'd call direct scientific material,
23 but nevertheless, he quotes him as saying that,

24 "Small setacia are now rare in the southern
25 North sea, where heavy ship traffic, oil and
26 gas exploration, and industrial contamination
27 might all be contributing factors to either
28 avoidance or death."

29 And I believe that's Mr. Utrecht's opinion, third-hand.

30 THE COMMISSIONER: Small setacia

R. Webb
Re-Direct

1 means small whales?

2 A Yes, not white whales, but
3 other whales -- species unknown to me of similar size.

4 MR. MARSHALL: Mr. Bayly, do
5 you have any questions?

6 MR. BAYLY: No sir, thank you
7 very much.

8 THE COMMISSIONER: A subpoena
9 for Dr. Utrecht?

10 MR. BAYLY: Later sir.

11 MR. MARSHALL: Then finally,
12 Mr. Webb, you had an air photo of the delta, and I
13 believe you distributed some copies of a similar
14 document, and you had penned onto the air photo, the
15 areas that you were discussing in your evidence and
16 cross-examination. Perhaps you could just explain
17 to the Judge what this is, and we could have it entered
18 then.

19 A Yes certainly. It's
20 a slightly larger satellite photograph than the one
21 I distributed.

22 THE COMMISSIONER: You distributed
23 two.

24 A Yes, that's correct.
25 Well, this is the same as the September 21 photograph,
26 I believe it is.

27 Q Well, 21st of September,
28 '73, I have that, and something called 30th of September,
29 '75. Right?

30 A One should be July, but

R. Webb
Re-Direct

1 it doesn't matter in this case, at any rate.

2 MR. MARSHALL: Upper right--
3 upper left hand corner has the date.

4 THE COMMISSIONER: Oh, well
5 I have 18th of September, '73, and 17, July '75.

6 A Right, those are the
7 numbers. This is the September photograph, but I've
8 just sketched on it, some of the reference points that
9 I used in my discussion yesterday. The general extent
10 of whales during July while they're in the estuary,
11 the most commonly plotted concentration area in West
12 Mackenzie Bay, derived from our four reports; and
13 then the smaller area that represents the area that
14 has been used as a concentration point during the
15 four years, and it is the only portion of that general
16 area that has in fact been used in that way, by large
17 numbers of animals over the four years. So I've
18 just sketched that on in relation to the crossing,
19 and I've also drawn in a couple of offshore islands.

20 THE COMMISSIONER: Fine, that
21 should be marked.

22 MR. MARSHALL: Do you wish to
23 see it?

24 THE COMMISSIONER: Yes, thanks.

25
26
27 MR. MARSHALL: Thank you Mr.
28 Scott.

29 MR. SCOTT: Dr. Sprague please.

30 (WITNESS ASIDE)

J.B. Sprague
In Chief

1 A Correct.

2 Q And that you've had
3 experience in these questions in the Maritime provinces,
4 Ontario, and have been engaged in projects in Laborador,
5 the Northwest Territories, and United States of America?

6 A Yes.

7 Q Yes. Now I understand
8 Doctor that most of your research has been the testing
9 of lethal and sublethal effects of pollutants on
10 marine and freshwater fish, and invertebrates in
11 the laboratory, and the materials and testing programs
12 that you've been engaged in are listed in your
13 curriculum vitae, which is attached to your paper.

14 A That's correct.

15 Q Yes. And that you've
16 served in areas of water pollution biology, on a
17 number of national and international working committees
18 on water pollution?

19 A Yes.

20 Q In particular, you assisted
21 in the preparation of the recommended water quality
22 criteria, for the Canadian Inland Waters Branch, under
23 the title, "Guidelines For Water Quality, Objectives,
24 And Standards".

25 A Yes.

26

27

28

29

30

J.B. Sprague
In Chief

1 Q You did the same thing
2 for the United States National Academy of Sciences
3 under the title,

4 "Water Quality Criteria,"
5 1972.

6 A I assisted in that.

7 Q Yes, and you did with
8 respect to criteria for heavy metals, the same sort
9 of work for the National Research Council of Canada.

10 A Yes.

11 Q Now I understand also,
12 and it's all listed at my request in your curriculum
13 vitae that you served as a Canadian delegate on various
14 inter-governmental and United Nations Committees on
15 Water Pollution.

16 A Yes.

17 Q And have been, as everybody
18 seems to be these days, a consultant to a number of
19 industries, governments, and anybody else who needs
20 a consultant on water pollution.

21 A Yes.

22 Q And attached to your
23 curriculum vitae I have asked you to list the Water
24 Pollution Committees on which you have participated and
25 the research papers and documents which you have either
26 prepared or supervised, and have you done so?

27 A Yes.
28 MR. SCOTT:

29 Well now, first of all
30 Mr. Commissioner, I ask that the curriculum vitae and
the papers be marked as the next exhibit.

J.B. Sprague
In Chief

1 (SATELLITE PHOTO WITH WHALE CONCENTRATION AREA
2 MARKED BY MR. WEBB MARKED EXHIBIT 514)

3 (QUALIFICATIONS & EVIDENCE OF J.B. SPRAGUE
4 MARKED EXHIBIT 515)

5 MR. SCOTT: Q Now, Dr. Sprague,
6 would you just carry on with your paper, please? I
7 think, sir, you have a copy of it, have you?

8 A Well, Mr. Commissioner,
9 my remarks today will be on water quality criteria for
10 protection of aquatic life and it perhaps might be
11 fair to start with a summary of my reactions to the
12 background studies which were carried out by Gas
13 Arctic and some of the government studies. I'm afraid
14 I haven't had a chance to look at any of the materials
15 from Foothills. I would say then that I am very
16 much impressed by the baseline studies and the impact
17 studies carried out by Arctic Gas. I think the work
18 on fish and other aquatic life is high-quality work,
19 and provides a good deal of new knowledge.

20 I think the amount of work
21 shows just how intent we all are on avoiding any serious
22 environmental problems, in the north, and I must say
23 in my experience that's a great improvement compared
24 to what we used to have, say, in the 1950s when there
25 were very few people doing this. So I would ask that
26 my further remarks which come later should be taken
27 in this context of general approval of these background
28 studies which I think are very good.

29 In particular I am very impressed
30 with two reports, the Government Pipeline Application

J.B. Sprague
In Chief

1 Assessment Group's Report and the foregoing report of
2 the Environment Protection Board, and I'm in more or
3 less total agreement with these reports which I
4 consider highly perceptive. I would recommend that
5 any decisions arising from this hearing^{should} incorporate
6 any concrete suggestions on fisheries and water quality
7 which are in those reports.

8 In particular I agree with
9 the Environment Protection Board, Volume 1, page 41,
10 which says more or less that the applicant shows
11 awareness, but has not transferred this awareness into
12 environmental specifications. This fits with my
13 general impressions of reading the background material,
14 that a vast amount of information on baseline studies,
15 but there's an absence of specific numerical standards
16 for water quality and a lack of exact specifications
17 for tolerable construction practices. I notice that
18 the application says they're going to minimize^{this effect} or
19 avoid certain problems, but very often it doesn't say
20 how they're going to do this or what level of quality
21 will be maintained in water. So in general today I'm
22 going to recommend specific regulations. Some of these
23 will be similar to those ones proposed by E.P.B. in
24 their Environmental Code.

25 Secondly, perhaps it would be
26 fair if I gave some sort of background on my general
27 opinions on this subject of avoiding environmental
28 damage which arise from my own experience. Mostly this
29 experience is not in the north, but I think it's
30 somewhat relevant anyway.

J.B. Sprague
In Chief

1 I have some ideas on how
2 water quality criteria should be used to protect
3 aquatic life, and applied to the Mackenzie Valley
4 Pipeline I am particularly wary of the side effects
5 of construction activities because in my experience
6 with mining or forestry or road construction,
7 people doing the construction are generally very busy
8 people and they have enough of a problem to get their
9 everyday work done with the usual small crises that
10 arise. My experience has been that they seldom have
11 enough leisure time, so to speak, to be thinking about
12 environmental problems as they work along.

13 In particular I'd like to cite
14 an example which is a long way from here, but it's close
15 to my home in Guelph, about construction work for an
16 expressway crossing of a small stream in Guelph. The
17 stream, oddly enough, even though it's within the
18 city limits, is a trout stream or if you like, a char
19 stream, it's mostly covered in cedar bush and it has
20 a herd of deer that comes in every winter. So it's
21 not your typical Southern Ontario stream. The city
22 and the Ministry of Transportation in Ontario were
23 somewhat worried about the effects of this express-
24 way crossing and development on the stream, so a rather
25 large study was commissioned for such a small stream.

26 There was quite a team of
27 engineers and planners and environmentalists assembled,
28 which eventually produced about three inches of
29 report which again was quite a bit for a small stream.
30 This team came up with specific recommendations which

J.B. Sprague
In Chief

1 was supposed to guarantee that there wouldn't be
2 any deleterious effect. In other words, this was a
3 classic study on how to tiptoe through the environment
4 without doing any harm. We thought we had it nailed
5 down. Our recommendations were silt traps on the
6 expressway crossing, minimal cutting of trees, and
7 construction practice, things like this. So we thought
8 we were in good shape. But what my student and I
9 actually saw on this project bore little relation to
10 the things we thought were going to happen.

11 For example, bulldozer opera-
12 tors would just casually drive across the stream,
13 even though 40 yards more travel would have taken them
14 across a road. It took several complaints to stop
15 this. The banks of the new road were to be re-sodded,
16 not reseeded but re-sodded very quickly. This somehow
17 didn't get done and there was considerable erosion
18 of the banks of the -- the embankments of the road.
19 There was a construction yard there which got churned
20 up in a lot of mud, and once provided an oil spill,
21 we don't know how this happened. The silt traps didn't
22 get cleaned out as they should have been cleaned out,
23 and finally when there was rechannelization of the
24 stream back from its diversion through the new
25 culvert, there was a fairly large surge of silt which
26 went downstream and reached 1,400 parts per million
27 and had quite a noticeable effect on fish populations,
28 it reduced them to about half, for a short period.

29 One of the other interesting
30 things was that part-way through the operation the city

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1 engineer came forward with a very nice plan for a
2 new sewer line in the area which went right down the
3 stream bed, and this seemed rather strange to the
4 environmentalists on the panel.

5 There were further changes
6 a couple of years later, a followup study noted other
7 changes in enrichment of the stream and changes in
8 fish population which seemed to be associated with
9 urbanization even though development had not proceeded
10 scarcely at all by that time.

11 So these were the strange
12 things that happened with a small stream in Southern
13 Ontario which is not noted for environmental problems.
14 There is no permafrost and the climate is quite mild
15 there.

16 So these experiences have
17 convinced me first of all that there should be detailed
18 regulations for construction activities.

19 Secondly, that you should
20 spell out water quality standards with numerical values.

21 Furthermore, that there should
22 be an inspection system for compliance.

23 It's along those lines that
24 I'll talk today. Now, I understand that water quality
25 criteria have not been dealt with extensively so far,
26 so this is mostly what my report is on and perhaps I
27 owe a little explanation or background on water
28 quality criteria. A suitable simple definition might
29 be that a water quality criteria is a scientific
30 requirement for quality of water needed for a certain

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1 use, in this case for a certain level of environmental
2 protection. The emphasis here is that this is a
3 scientific requirement. In other words, you have to
4 have a numerical value for any particular pollutant
5 that you're concerned with, and this must be based on
6 the best available scientific knowledge.

7 I point out that for the
8 same pollutant, criteria for drinking water, for example,
9 may be quite different from the criteria for fish. As
10 a matter of fact, safe levels of certain chemicals in
11 drinking water may be very harmful for fish, or may be
12 violently lethal to fish. For example, copper and
13 chlorine maybe 100 or 1,000 times more dangerous for
14 fish than for drinking water. So you have to tailor
15 these specifically for the use you're thinking of, in
16 this case environmental protection.

17 Today much of the work to
18 determine these scientific numbers takes place in the
19 laboratory. This is the most efficient and cheapest
20 place to do it. A good example of how you determine
21 these numbers would be to go through one complete
22 life cycle of fish in a laboratory exposed to the
23 pollutants you're interested in. You expose groups
24 of fish to constant different concentrations over
25 a lifetime from very recently hatched fish till they
26 grow up, spawn, and through the next small fish.

27 This is a very good type of
28 sub-lethal experiment. If anybody is worried about
29 how these criteria are derived, I do have some slides
30 which I could show of a typical set of laboratory

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1 experiments. From such experiments on many kinds of
2 sub-lethal effects in the laboratory, scientists are
3 able to estimate what are the safe concentrations
4 of any given pollutant in the water.
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1 Ideally, these should be
2 confirmed by field experiments in nature but these are
3 expensive and usually difficult to control, so field
4 experiments are rather more few. But, in general, the
5 laboratory tests are confirmed by a field experiments
6 which have been done. For example, about the best
7 one I can think of was an experiment in Ohio where they
8 actually dosed a stream with copper, kept cages of
9 fish in the affected area, noted their spawning reactions
10 and noted other things in the streams and the results
11 of the field exactly fell in with the laboratory
12 predictions.

13 This was on reproductions
14 and the avoidance reactions of fish were somewhat lower.

15 Now, to date, the most comp-
16 rehensive summary of these water quality criteria that
17 I know is in something which is called the "blue book"
18 and it's official title is "Water Quality Criteria 1972"
19 put out by United States Academy of National Sciences --
20 National Academy of Sciences, sorry. I'll leave this
21 copy for the Commission in case it's needed later
22 on.

23 There are chapters in there
24 on fresh water aquatic life and marine life. I think
25 the fresh water aquatic life is very relevant.

26 This is a good compendium, it
27 was produced the fresh water and marine sections were
28 produced by about 63 scientists, working from time to
29 time over about one and one-half years. It's about the
30 best that I know of to date. I would recommend these

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1 criteria as a basis for arriving at criteria for any
2 pipeline regulations.

3 Now, the only question that
4 might arise is how good are these United States criteria
5 for northern waters. I don't consider this a problem.
6 The criteria were written with the intention of covering
7 almost all types of water and they would include the
8 types of water found in the Territories. Furthermore,
9 differences between fish species are really not as diff-
10 erent or not as great as you might expect. I can give
11 examples of that, if it's required. But, in general,
12 you might say that fish are fish in their sensitivity
13 to pollution.

14 The main factor in northern
15 water quality criteria would be short growing season,
16 short reproductive season for fish, would mean that you
17 probably should have even stricter adherence to the
18 criteria.

19 So, far, I've been dealing with
20 criteria, and now I'd like to say a couple of words about
21 standards and regulations for water quality.

22 Standards are, of course,
23 legal limits. They must be set down in regulations.
24 They may or may not be based on scientific criteria but
25 it's best if they are.

26 Often, the standards are
27 simplified from the criteria into some sort of cut-and-
28 dried tests which may be easily applied. Sometimes
29 there's a compromise reflecting different uses of water.
30 Sometimes a compromise for a best practicable treatment,

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1 which is available at the moment. But normally, these
2 cut and dried tests are carefully thought out to provide
3 the protection you need in the environment.

4 For example, current Federal
5 Government regulations on oil refinery wastes specify
6 maximum limits for five chemicals in the effluent pipe
7 of the refinery and they further say that the effluent
8 coming out of that pipe must not kill rainbow trout
9 in four days of exposure. Well, nobody expects to have
10 rainbow trout growing in the effluent pipe. They
11 simply use this as a short-cut test in order to provide
12 the desired protection in the natural water after
13 dilution.

14 Implementation of these
15 standards and criteria. I've seen four problems come
16 to the fore in protecting natural waters and I'll
17 just name these and then look at each of them in a
18 little more detail.

19 The first problem is lack of
20 specific numerical standards. The second is lack of
21 environmental preplanning. The third is lack of
22 knowledge of environmentally desirable practice by
23 industrial operators or failure to adhere to best
24 practice and the fourth is lack of inspection by govern-
25 ment or regulatory authorities. Sometimes simply
26 failure to enforce regulations.

27 To look at the first one,
28 which is lack of numerical standards, this is a serious
29 problem that I've come to the conclusion you really
30 must specify numbers if you're going to have environmental

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standards. You must have numbers for maximum allowable limits of oil, of silt, or whatever you're concerned with. These must be specified in any particular situation.

So far, as far as I can see, they're not specified even in the Environmental Protection Board Code. The code remains fairly general and doesn't name any numbers. So later in this presentation, I put forward the beginnings of some possible standards as examples.

Of course, it's the responsibility of government to lay down these standard numbers. Nevertheless, the most satisfactory numbers that I have seen are not laid down only by government but by a co-operative government industry task force which sits down together and hammers out something that is suitable to protect aquatic life and also achievable. Unfortunately this process usually takes some time and in the present case, I think, the procedure would have to be speeded up.

Usually I've seen them take about two years.

The second point is environmental preplanning and I cite this example from Guelph Ontario of the engineers sewer line down the trout stream as a good example that his sewer lines was a beautiful sewer line from an engineering point of view. It was failsafe, economically and engineering wise, it very efficient, but from the trout's point of view, it was a total disaster. No amount of environmental

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1 patchwork on top of this plan would make it good from
2 an environmental point of view and this is typical
3 of what you see happening in industrial development,
4 that the engineering plans come first and the environ-
5 ment is tacked on afterwards.

6 So, it's important to do,
7 as we're doing here, to put the environment in at an
8 early stage and of course, I'm glad to this being done.

9 The applicant has all obviously
10 thought a good deal about routing of his operations to
11 avoid sensitive areas. The only thing that's not come
12 so far, is the specific water quality objectives. These
13 also need to be know and incorporated into any planning
14 processes.

15 The third thing was the
16 environmental awareness of operators and I think this
17 has been pretty well covered. The training program
18 for construction people has been documented by the
19 E.P.B. report and the government assessment group and
20 I would simply refer to those reports for guidance.

21 The fourth thing is inspection.
22 and the applicant intends to field his own force of en-
23 vironmental inspectors and I consider this is a
24 commendable thing, very desirable and almost certainly
25 very effective.

26 However, I agree with the
27 report of Dr. McCart which I just read last, that it
28 might be advisable if the inspectors were not in the
29 direct employ of the company, but perhaps indirectly
30 through a consultant.

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1 THE COMMISSIONER: Well, I
2 think that will draw a round of applause.

3 (LAUGHTER)

4 A The government will also
5 no doubt be checking for environmental compliance but
6 I have my doubts on this -- the effectiveness of this
7 also because it's not unknown for field officers to be
8 hampered by bureaucratic traditions and slowed down
9 in their work and it's not without precedent for their
10 zeal to be dampened within their own department.

11 So, I'm a little dubious about
12 the government inspection procedures also. In short,
13 I subscribe to the E.P.B. point of view on page 53 of
14 their volume one, that third group should be in action
15 here. A formal independent body will be required, they
16 say, to carry out the mechanisms of public scrutiny
17 and accountability and I would say that this should
18 be a group which has already demonstrated capability
19 and integrity.

20 Furthermore, they should
21 be funded by a block grant or a block contract that
22 allows them to provide an environmental inspector for
23 each field crew which is above a minimum size or each
24 area above a minimum size.

25 Their funding should also be
26 adequate to carry out public reporting.

27 So, I think this is of para-
28 mount importance, not only in the initial decisions
29 such as we're seeing here where there's an open
30 public scrutiny, but also in the operations phase.

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1 In case you're worried that
2 there may not people available to do this job, I can
3 tell you that those of us in the university business
4 are quite concerned that there are a number of bright,
5 young people looking very hard for such meaningful
6 work as this and you'll have no trouble getting good
7 people to do it.

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1 Well, that completes my
2 preamble which is a very long preamble, but I'd now
3 like to turn to criteria and regulations for certain
4 relevant pollutants.

5 The first one I'd like to
6 deal with, because I think it's very serious, is
7 insecticides. Of course we all know that biting
8 flies can be a major factor during the summer in any
9 northern operation, and insecticides are the obvious
10 control measure but it's been amply documented that
11 they may have disastrous environmental side effects
12 much more serious than the primary operation.
13 Yet they are often overlooked or ignored. A case in
14 point is a recent look some of us had at the Oil
15 Sands development, we were concerned about pollution
16 from the Oil Sands operations. In the rather late
17 stage some of us mentioned that there was a biting
18 fly control program, I think in the Athabasca River
19 which they mentioned the number of, the weight of
20 insecticide that was being used to control biting
21 flies, and it just boggled my mind so much that I've
22 forgotten the number, but in my opinion it far outweighed
23 the pollution potential of the Oil Sands operation.
24 It had been totally ignored as far as I could see,
25 to that point.

26 Since all the biting flies
27 are either living in the water or in watery places,
28 the obvious insecticide control measure is by putting
29 insecticides in ^{the} water, and this has disastrous side
30 effects, as has been amply documented. I just cite Mr.

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1 Hatfield's report of 1969 as evidence of this, and
2 my conclusion here is that there should be absolutely
3 no use of waterborne insecticides to be put into the
4 water.

5 I feel also that there should
6 be no wide-scale aerial spraying of insecticides. This
7 also has been amply documented to have bad side
8 effects on aquatic life. I simply cite the more than
9 20 years of experience in New Brunswick showing the
10 side effects of aerial insecticide spraying.

11 However, I spent a summer
12 employed, Mr. Commissioner, as a guinea pig for biting
13 fly rates and during this time our job involved every
14 hour you measured the biting rate of flies by
15 exposing part of your anatomy to the flies and seeing
16 how many bit you, so I realize that there's a big
17 comfort factor here and I think perhaps I would go
18 along with local fogging of insecticides perhaps in
19 camps, perhaps just in buildings, as some sort of a
20 comfort factor. Beyond that I would say that to any
21 expenditure on biting fly control should be limited
22 to providing personal protection to workers, repellants
23 or flyproof insect suits, things of this nature.

24 Now I see that the applicant
25 has stated there would be no use of insecticides or
26 herbicides north of 60, and this makes the criterion
27 standard in this case very simple. My recommendation
28 is that the regulations should specify no use of
29 insecticides or pesticides north of 60 degrees with
30 the possible exception of small-scale ground-based

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1 fogging of camps and buildings with non-persistent
2 insecticides.

3 The second type of environmen-
4 tal contaminant which has received a great deal of
5 attention is siltation and I think that the discussions
6 are extensive and adequate and the reports of the
7 applicant and in the government reports and E.P.B.
8 reports. My only negative comment is that in the
9 applicant's -- in Gas Arctic's reports, the early
10 parts deal with very high levels of suspended material
11 necessary to kill fish. This really isn't the problem
12 we're concerned with here. The real problem, of course,
13 is the effect of silting on the bottom, particularly
14 if there are eggs on the bottom. As I read the
15 reports, I see that the consensus is that pipeline
16 construction would cause some damage through siltation
17 but this would be mostly short-term.

18 I agree with this except that
19 to avoid more serious damage careful procedures would
20 have to be maintained. In this situation everything
21 depends on prevention, and two things are of most
22 concern:

- 23 1. The day to day construction practice and
24 2. The amount of vegetation removed from the land
25 leading to silt runoff, slumping and erosion.

26 For each of these things
27 -- I'm sorry, I seem to be having trouble.

28 THE COMMISSIONER: Take your
29 time, have a glass of water.

30 A All right.

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For each of these things it's difficult to specify the exact procedures and it's difficult to maintain a high standard of practice under everyday conditions. That's out of my special field and I would only repeat what others have said, that the procedures and practices should be specified in detail in a code of regulations.

However, speaking as an aquatic biologist, I think there should also be guidelines for amounts of finely divided solids that are allowable in surface waters. Such specified levels would be checks that could be invoked to protect the surface waters.

Here we run into a difficulty. Most criteria are based on the amounts of suspended solids in the water, that is the weight of solids in a given amount of water. To measure these it's a difficult and fiddly procedure. You have to have a drying oven and filtration apparatus, you have to have an accurate balance, and you don't get the answer for at least a day. So although the criteria are based on suspended solids, it's a difficult one to apply under field conditions, and day to day control using this criteria would be cumbersome.

Another measure of finely divided solids in water is the measure called turbidity which really is light penetration through the water as affected by suspended solids. This is fairly quickly measured, either by an electrical apparatus, which measures light transmission, or by making up standard

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1 solutions and comparing your sample with these
2 standard solutions visually. This is fairly quickly
3 done in the field and could be used for quick feedback
4 on control procedures.

5 Now the difficulty comes
6 that really it's difficult to predict the relationship
7 between suspended solids, which is weight, and turbidity
8 which is light transmission. You usually get a lot
9 of scatter in the relationship between these two
10 things. Nevertheless, as a water quality standard,
11 I think I would have to recommend for pipeline applica-
12 tions the use of turbidity because of its simplicity
13 and rapid feedback.

14 I think I would depend on
15 turbidity as a primary standard possibly with a standard
16 for settleable solids in addition. I haven't mentioned
17 settleable solids, it's simply the amount of solids
18 which settle out in a cone during an hour. The problem
19 with this is that the test is really designed for
20 sewage with high suspended solids, and it sometimes
21 doesn't give you a reading in streams.

22 Now I think it would be
23 possible to obtain empirical relationships between
24 turbidity and suspended solids to the area we're
25 concerned with, and I think it would be possible for
26 a group of scientists to sit down and hammer out
27 some suitable standards based on turbidity.

28 Furthermore, I think that the
29 standards should be on a sliding scale in relation to
30 the time that the condition persists. Obviously one

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1 minute of high turbidity is not as serious as one
2 day. They should also be related to the increase
3 over natural conditions. It doesn't make any sense
4 to have the same standard apply to all streams because
5 we know that some of them are very turbid in this
6 region.

7 So as a merely illustrative
8 example, this is simply put up as an example of how
9 we might go about this, I don't have any strong
10 feelings about the numbers, I am sure they're not
11 accurate. I would suggest the standard might be some-
12 thing like this. Turbidity and settleable solids
13 must not be increased more than ten times their natural
14 level at any time or place, nor more than four times
15 the natural level for any eight-hour period, nor more
16 than twice the natural level for more than 96 hours
17 during any month. The arbitrariness of these numbers
18 might be less if they're related to the Blue Book
19 criteria, or to those discussed in the E.P.B. Report.

20 I would further recommend
21 one other standard for use when it was needed. This
22 would be a biological standard of water quality and
23 it would be based on the living invertebrate organisms
24 in the stream bottom. It would restrict the distance
25 downstream where there would be measurable demonstrable
26 effects on communities of these stream bottom organisms.
27 Such measure of biological effect, is good inasmuch
28 as it is a direct measurement of what we're interested
29 in, protecting aquatic life. It avoids these predictive
30 uncertainties of going from the Blue Book to a chemical

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In C hief

1 predicting
2 standard and back to the living system, and these
3 biological standards are particularly useful when
4 water quality criteria are less uncertain. They are
5 also useful because they can be made after the event,
6 that the bottom living invertebrates reflect conditions
7 for some weeks or some months in the past, they are
8 around-the-clock monitors of water quality.

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1 And of course this gives some
2 sort of added what I call "preventive incentive",
3 for pollution control, it would give the construction
4 personnel some sort of a moral boost, no doubt, to know
5 that the aquatic communities were monitoring them,
6 even if the human inspector happened to be away that
7 day.

8 The communities would also
9 monitor all sorts of environmental disturbance, not
10 only siltation, and I would suggest again, as an
11 illustrative example, that the standard might be
12 something like this. The diversity index of benthic
13 macro-organisms should not be changed more than 25%
14 at a distance of one-quarter mile downstream of
15 operations.

16 So to summarize my remarks
17 on siltation, I think that regulations should specify
18 three things. First, detailed practices for construction,
19 land use and re-vegetation. Second, allowable levels
20 of turbidity and perhaps settleable solids, related
21 to increase over natural levels at the time, and
22 related to the duration of the elevated levels. And
23 third, maximum allowable distance downstream for an
24 appreciable change in communities of stream-bottom
25 organisms.

26 "Petroleum" was the next item
27 I have some remarks on, and this poses special problems
28 in northern areas because of the slow disappearance of
29 oil, and the vulnerability of many important semi-aquatic
30 birds and mammals. And we've heard that the problems

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1 of oil would come from exploration and transportation
2 and use.

3 Accidental spillage should be
4 rare, but the only way to avoid problems is to prevent
5 them by designing ahead of time, safeguards such as
6 dykes, booms, collecting ponds, easily available
7 cleanup equipment. I think these safeguards should be
8 specified in regulations.

9 Aside from spills, there could
10 be damage to waterfowl from continued small leaks or
11 sloppy operations. This could be serious if it were
12 in staging areas. It has been estimated for example
13 that as little as 7 grams of oil, which is about $\frac{1}{4}$
14 of an ounce, on the plumage of a duck, can lead to its
15 death, so in view of this the accepted criterion to
16 guard against damage to aquatic life is quote,

17 "no visible sheen of oil on the surface of the
18 water,"

19 unquote. This is an easily observable criterion, and
20 easily enforceable, and should be incorporated in
21 regulations.

22 Direct toxicity of oil to fish
23 and other aquatic life is less worrisome, and would
24 usually be avoided if you stuck to the avoidance of
25 oil sheens on the surface. In unusual situations, if
26 there are any, when oil is dispersed directly into
27 the water, I would suggest that regulations should
28 adopt the "blue book" criterion that oil should not
29 exceed 0.05 of the lethal concentration for aquatic
30 organisms. That's one twentieth of the lethal level,

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1 and the resulting numbers might be fairly low. Lethal
2 levels for freshwater fish are in the vicinity of 200
3 to 2,000 parts per million of oil, depending on the
4 type of oil. Safe levels would accordingly be 10 to
5 100 parts per million. For marine organisms, levels
6 seem to be lower. The lowest so far is one that my
7 student obtained, which showed that 2.7 parts per million
8 of oil killed lobster larvae in two days, and 0.14
9 milligrams per litre was the threshold for sublethal
10 effects. I would expect that other marine crustaceans
11 could -- would be equally sensitive.

12 So to summarize my recommendations
13 on petroleum, I would think there again should be three
14 things in the regulations. First of all, precise
15 physical safeguards to prevent escape of oil, for each
16 pipeline related activity. Secondly, no visible sheen
17 of oil on the surface of the water; and third, oil
18 concentrations in water to be lower than 0.05 of the
19 lethal concentration for sensitive aquatic organisms.

20 "Sewage" is the next item.
21 Lowering of dissolved oxygen could be quite a primary
22 concern, from sewage disposal in the north, and this
23 is dealt with in excellent fashion by the EPB report,
24 page 227 to 229 of volume 4, and I refer to that as
25 background.

26 I agree with the EPB recommendation
27 on dissolved oxygen, and agree that the regulations
28 should specify the oxygen levels should not at any
29 time or place, be depressed beyond the "High level of
30 protection" of the "blue book". The EPB report actually

1 uses inland waters criteria, but the same as the "blue
2 book." I was involved with writing them both.

3 To achieve this would require
4 certain standards of practice for disposal of
5 sewage, and I agree with the general recommendations
6 so far. The applicants proposal states that sewage
7 would be stored over winter, and lagooned for a year
8 or given equivalent treatment. I would add the
9 stipulation that except on very large bodies of water,
10 final disposal should be on land, where the material
11 can be assimilated with less damage, little damage.

12 So about sewage, I think
13 regulations should specify, first of all, dissolved
14 oxygen not lower than concentrations for the "High
15 level of protection" specified in Water Quality Criteria,
16 1972, page 134; and secondly, that sewage should be
17 lagooned for a year, and disposed of on land in most
18 cases.

19 "Temperature" is the next item
20 and I think this is not a major problem. I don't think
21 that an accident with warm pipe-testing fluid would
22 have long-lasting effects, according to the temperatures
23 stated by the applicant. As a matter of safe practice,
24 I would say that such warm water should not be
25 discharged directly to small streams.

26 Potential damage could be
27 associated with any permanent or semi-permanent
28 operation, which discharged appreciable amounts of
29 cooling water. I don't know whether there'll be any
30 of these, but if there are any operations involving

1 cooling water that goes on for a long time, their
2 discharge should not go into small or moderate sized
3 bodies of water. The problem here is that you could
4 disrupt the normal seasonal clocks, of aquatic organisms,
5 interfering with their reproductive cycles, or other
6 cycles, so I would simply say for temperature, -
7 regulations should specify, first, no discharge of
8 warm water to small waterbodies, and some simple
9 numerical guideline should be supplied on what you mean
10 by small. SEcondly, in any permanent or semi-permanent
11 installations discharging warm water, the water quality
12 criteria of the "blue book" should be obeyed.

13 Coming now to methanol, I think
14 that one method put forward by Canadian Arctic Gas for
15 disposal of methanol pipe-testing fluid would yield,
16 after distillation, a residue with methanol concentration
17 of 1%, and this would be spread on the land. Certainly
18 I think this is very satisfactory for aquatic habitat.
19 If methanol solution is to be disposed of in water,
20 it should receive immediate dilution to non-toxic
21 concentrations, and I would recommend a fairly modest
22 safety factor of 5, to be applied to known toxicity,
23 for whatever exposure time is involved.

24 In estimating these numbers,
25 I would think that the toxicity research supplied by
26 Canadian Arctic Gas is very reasonable. The lethal
27 concentration which they found, of about 2% for fish,
28 agrees reasonably well with most modern estimates. For
29 example, an estimate of about 1% for creek chub,
30 by Gillette et al, 1952. It also agrees with toxicity

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1 for some marine organisms, although some are more
2 sensitive, for example the brown shrimp, is killed
3 by .17% methanol. So it seems that fish would be
4 safely protected for exposures of several days, if you
5 limited concentrations in the stream to about 1/5
6 of 1%, or 0.2%. These concentrations might perhaps
7 harm some invertebrates. If there are fish eggs in
8 the stream, the applicant's work seems to indicate
9 a threshold for effect of about 0.1% which seems reasonable
10 and applying a safety factor of 1/5 of this, you end
11 up with a regulatory level of something like 0.02%.

12 I don't see any easy solution
13 for the problem of preventing aquatic damage if
14 there is a rupture of the pipe during testing. Any
15 protective measures that I can visualize, applied at
16 every stream crossing, might have more overall
17 harmful effects than the occasional rare rupture,
18 so I don't have any solution to suggest on guarding
19 against spills.

20 My recommendations on
21 regulations are two. First of all, that methanol
22 solution should be reduced to 1% concentration and
23 finally disposed of on land; and secondly, if this is
24 not possible, if you have to put methanol into water,
25 disposal should be gradual enough that dilution would
26 bring concentration to 1/5 of the lethal level for
27 fish, which is about 0.2%, as a regulatory level, or
28 1/5 of the toxic level for fish eggs if they are in a
29 river, which would be a regulatory level of 0.02%.

30

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1 And finally, Mr. Commissioner,
2 considering other toxicants; apparently no other major
3 toxicants are foreseen. Nevertheless, I would think
4 that there should be some sort of blanket recommendation
5 referring to recommended levels in the "blue book", so
6 I would recommend that regulations should specify for
7 other toxic or harmful substances reaching surface waters,
8 concentrations should not exceed those recommended in
9 "Water Quality Criteria, 1972".

10 MR. SCOTT: Thank you Dr.
11 Sprague. I wonder, Mr. Commissioner if Dr. Sprague's
12 paper with the attachment which is the references,
13 could be made the next exhibit, and if the blue book
14 could be made the exhibit following that, which, I
15 understand is really identified as "Water Quality
16 Criteria 1972", is that correct.

17 A Yes.

18 MR. SCOTT: If you please,
19 sir, I would suggest that Dr. Sprague might show his
20 slides and be cross-examined in the morning?

21 THE COMMISSIONER: Excellent.
22 All right, we'll adjourn until 9:30 in the morning then.

23 ("WATER QUALITY CRITERIA 1972" MARKED AS EXHIBIT
24 516)

25 (PROCEEDINGS ADJOURNED TO MARCH 26, 1976)
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